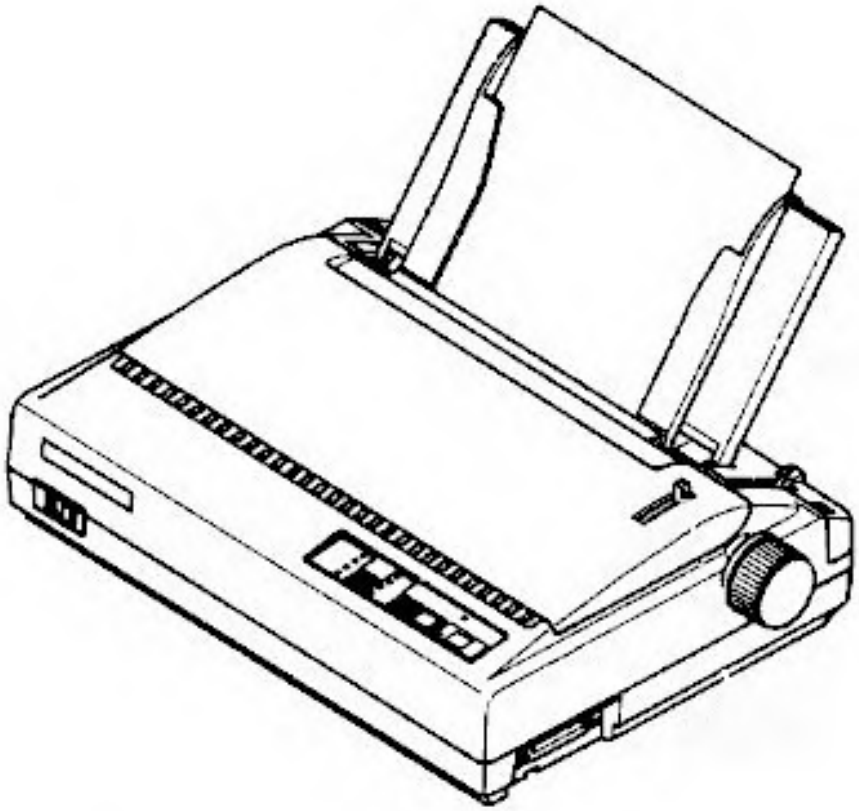
DOT MATRIX PRINTER

NX-1000SERIES
LC-10SERIES

TECHNICAL MANUAL

[NINTH EDITION]



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INTRODUCTION

This manual describes dot matrix printers as shown below.
It is intended for use as a reference for periodic inspections and maintenance procedures.
This manual is prepared for use at a technical level and not for the general user.

Model	Interface	Mono/Colour	Destination	Ver.
NX-1000MULTI-FONT PRINTER	Parallel Type	Monochrome	Except for European market	Ver. 1 and Ver. 1.5
NX-1000CMULTI-FONT PRINTER	Commodore Type	Monochrome		
NX-1000COLOUR PRINTER	Parallel Type	Colour		
NX-1000C COLOUR PRINTER	Commodore Type	Colour		
LC-10 MULTI-FONT PRINTER	Parallel Type	Monochrome	For European Market	
LC-10CMULTI-FONT PRINTER	Commodore Type	Monochrome		
LC-10 COLOUR PRINTER	Parallel Type	Colour		
LC-10C COLOUR PRINTER	Commodore Type	Colour		
NX-1000 II MULTI-FONT PRINTER	Parallel Type	Monochrome	For American and Asian market	Ver. 2
LC-10 II MULTI-FONT PRINTER	Parallel Type	Monochrome	For European and Pacific market	

- This manual is divided into the following sections:

Chapter 1 General Specifications
Chapter 2 Theory of Operation
Chapter 3 Adjustments
Chapter 4 Parts Replacement
Chapter 5 Maintenance and Lubrication
Chapter 6 Troubleshooting
Chapter 7 Parts List (Ver. 1 and Ver. 1.5)
Chapter 8 Parts List (Ver. 2)
Appendix Explanation of Principle ICs

- First edition : Nov. 1987 Only Monochrome Type
  Second edition : Mar. 1988 Add Colour Type
  Third edition : Dec. 1988 Add Ver. 1.5 of Parallel Type
  Fourth edition : Jul. 1989 Add NX-1000 II and LC-10 II (Ver. 2 of Parallel Type)
  Fifth edition : Apr. 1991
  Sixth edition : Aug. 1993
  Seventh edition :Sep. 1995
  Eighth edition :Apr. 1996
  Ninth edition :Aug. 1997

CHAPTER 1
GENERAL SPECIFICATIONS

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1. General Specifications

1-1. Parallel Type

Printing

Printing method	Serial impact dot matrix	
Printing speed	120 characters per second (in Draft pica for Ver. 1 and Ver. 1.5) 30 characters per second (in NLQ pica for Ver. 1 and Ver. 1.5) 150 characters per second (in Draft pice for Ver. 2) 38 characters per second (in NLQ pica for Ver. 2)	
Data buffer	4K bytes (for monochrome type), 8K byte (for colour type) when not used for download characters. 1-Line buffer when using download	
Paper feed	2.7 inches/second (during page feed) Friction and push-tractor feed	
Printing direction	Draft: bi-directional or unidirectional (selectable), logic seeking NLQ and graphics: unidirectional, logic seeking	
Character set Standard character set IBM character set Downloadable characters International character sets	 96 ASCII characters 244 characters (ASCII,international characters, symbols, block graphics) Max.192 (draft) or 78 (NLQ) 14 sets (USA, France, Germany, England, Denmark I, Denmark II, Sweden, Italy, Spain I, Spain II, Japan, Norway, Latin America, Denmark/Norway	
Dot matrix size Character matrix Bit-image graphic 	 9 × 9 dots (Draft pica) 18 × 23 dots (Courier and Orator pica) 18 × 18 dots (Sanserif pica,elite) 12 × 11 dots (IBM block graphics,pica) 18 × 19 dots (Courier and Orator elite) 18 × 12 dots (Condensed pica) 18 × 10 dots (Condensed elite) 8 × 480 dots at 60 dpi (Single density) 9 × 480 dots at 60 dpi (Single density) 8 × 576 dots at 72 dpi (Plotter mode) 8 × 640 dots at 80 dpi (CRT I) 8 × 720 dots at 90 dpi (CRT II) 8 × 960 dots at 120 dpi (Double density) 9 × 960 dots at 120 dpi (Double density) 8 × 960 dots at 120 dpi (High speed) 8 × 1920 dots at 240 dpi (Quadruple density)	
Line spacing	1/6 inch standard	1/8, n/72, or n/216 inch programmable
Column width	80, normal pica 137, condensed pica	96, normal elite 160, condensed elite

Paper

Single sheets	5.5 ~ 8.5 inches wide	0.07 ~ 0.10 mm thick
Fanfold paper	4 ~ 10 inches wide Max, 0.28mm thick (3-ply)	0.07 ~ 0.10 mm thick (single-ply)

GENERAL SPECIFICATIONS

Printer

Dimensions	Height 108 mm (4.3 inches) Width 384 mm (15.1 inches) Depth 287.5 mm (11.3 inches)
Weight	4.7 kg (10.3 pounds)
Power	120 VAC±10%, 60Hz. 220 VAC±10%, 50/60Hz. 240 VAC±10%, 50/60Hz.
Power consumption	Typ. 30W, Max. 60W
Environment	Operating temperature: 5 to 40°C (41 to 104°F) Operating humidity: 10 to 80%, non condensation Storage temperature: –30 to 65°C (–22 to 149°F) Storage humidity: 10% to 95% (at 40°C) (no condensation)
Print head	9 Pins Life: 200 million dots
Ribbon	Fabric ribbon cartridge Monochrome type ..... Black Colour type ..... Black/cyan/magenta/yellow Life: 1 million draft characters
Option	Automatic sheet feeder

Parallel interface

Interface	Centronics-compatible
Synchronization	By external supplied strobe pulses
Handshaking	By $\overline{\text{ACK}}$ or BUSY signals
Logic level	TTL
Connector	57-30360 Amphenol

1-2. Commodore Type

Printing

Printing method	Serial impact dot matrix
Print speed	120 characters per second (in Draft pica) 30 characters per second (in NLQ pica)
Data buffer	1-line buffer
Paper feed	2.7 inches/second (during page feed) Friction and push-tractor feed
Printing direction	Draft: bi-directional or unidirectional (selectable), logic seeking NLQ and graphics: unidirectional, logic seeking
Commodore character sets	
Standard graphics	Upper-case letters, digits, punctuation and symbols, graphic characters
Standard business	Lower- and upper-case letters, digits, punctuation and symbols, graphic characters
DIN graphics	Upper-case letters, international letters, digits, punctuation and symbols, graphic characters
DIN business	Lower- and upper-case letters, international letters, digits, punctuation and symbols, graphic characters
Downloadable characters	Max. 192 (draft) or 80 (NLQ)
International characters sets	10 sets (England, USA, France, Germany, Denmark I, Denmark II, Sweden I, Italy, Spain, Sweden II)

Printing

Dot matrix size		
Character matrix	9 × 9 dots (Draft pica) 18 × 23 dots (Courier and Orator pica) 18 × 18 dots (Sanserif pica,elite) 7 × 11 dots (Block graphics,pica) 18 × 19 dots (Courier and Orator elite) 18 × 12 dots (Condensed pica) 18 × 10 dots (Condensed elite)	
Bit-image graphic	7 × 480 dots at 60 dpi (Single density) 8 × 480 dots at 60 dpi (Single density) 7 × 960 dots at 120 dpi (Double density) 8 × 960 dots at 120 dpi (Double density) 8 × 960 dots at 120 dpi (High speed) 8 × 1920 dots at 240 dpi (Quadruple density)	
Line spacing	1/6 inch standard	1/8, n/72, or n/216 inch programmable
Column width	80, normal pica 137, condensed pica	96, normal elite 160, condensed elite

Paper

Single sheets	5.5 ~8.5 inches wide	0.07 ~ 0.10 mm thick
Fanfold paper	4 ~ 10 inches wide Max. 0.28mm thick (3 ply)	0.07 ~ 0.10 mm thick (single-ply)

Printer

Dimensions	Height 108 mm (4.3 inches) Depth 287.5 mm (11.3 inches)	Width 384 mm (15.1 inches)
Weight	4.7 kg (10.3 pounds)	
Power	120 VAC±10%, 60Hz. 240 VAC±10%, 50/60Hz.	220 VAC±10%, 50/60Hz.
Power consumption	Typ. 30W, Max. 60W	
Environment	Operating temperature: 5 to 40°C (41 to 104°F) Operating humidity: 10 to 80%, no condensation Storage temperature: –30 to 65°C (–22 to 149°F) Storage humidity: 10% to 95% (at 40°C) (no condensation)	
Print head	9 Pins Life: 200 million dots	
Ribbon	Fabric ribbon cartridge Monochrome type ..... Black Colour type ..... Black/blue/red/yellow Life: 1 million draft characters	
Option	Automatic sheet feeder	

Commodore interface

Interface Synchronization	Serial mode, for Commodore computers By external supplied clock (synchronous serial)
Logic level	TTL
Connector	6-pin DIN

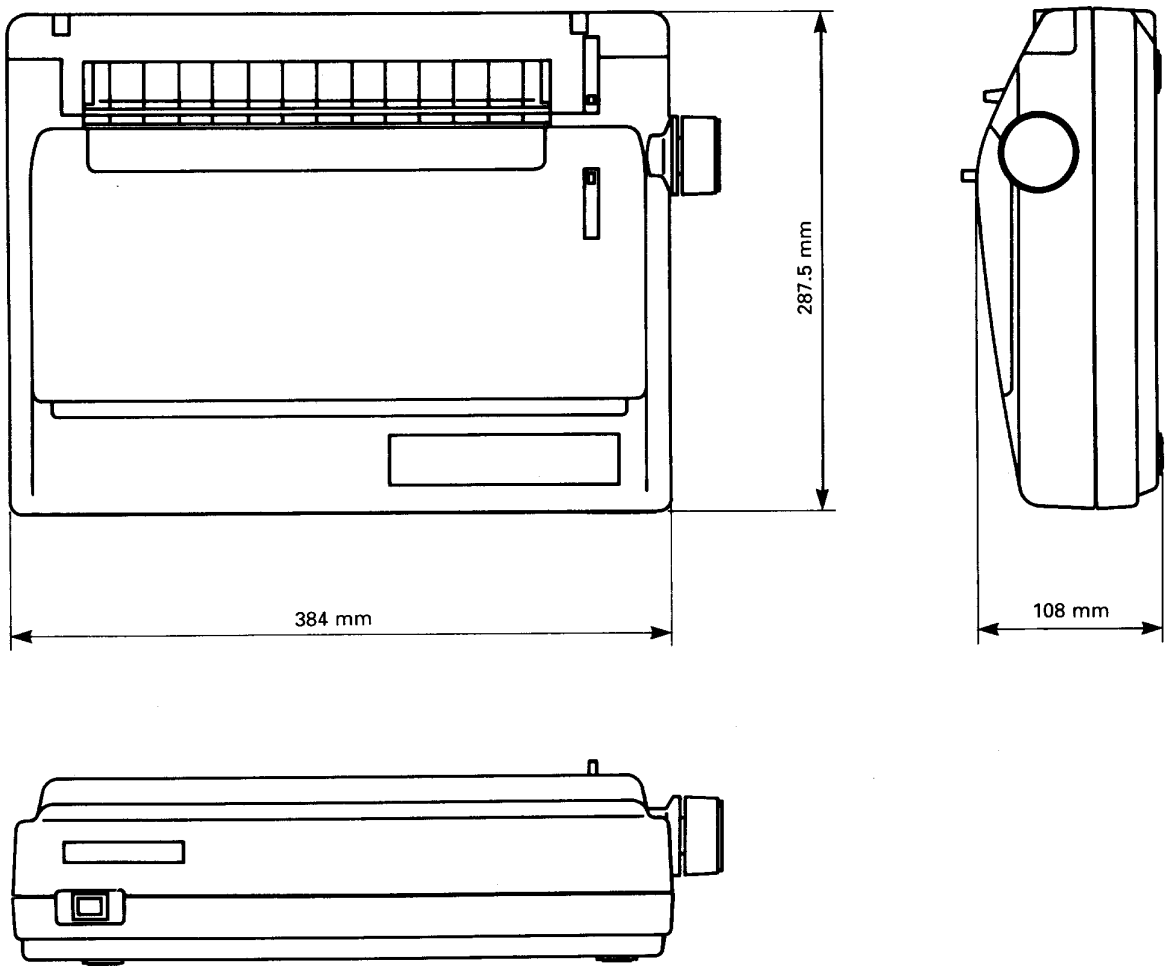


Fig. 1-1 External Dimensions

2. External Appearance and Composition

2-1. Names of Parts

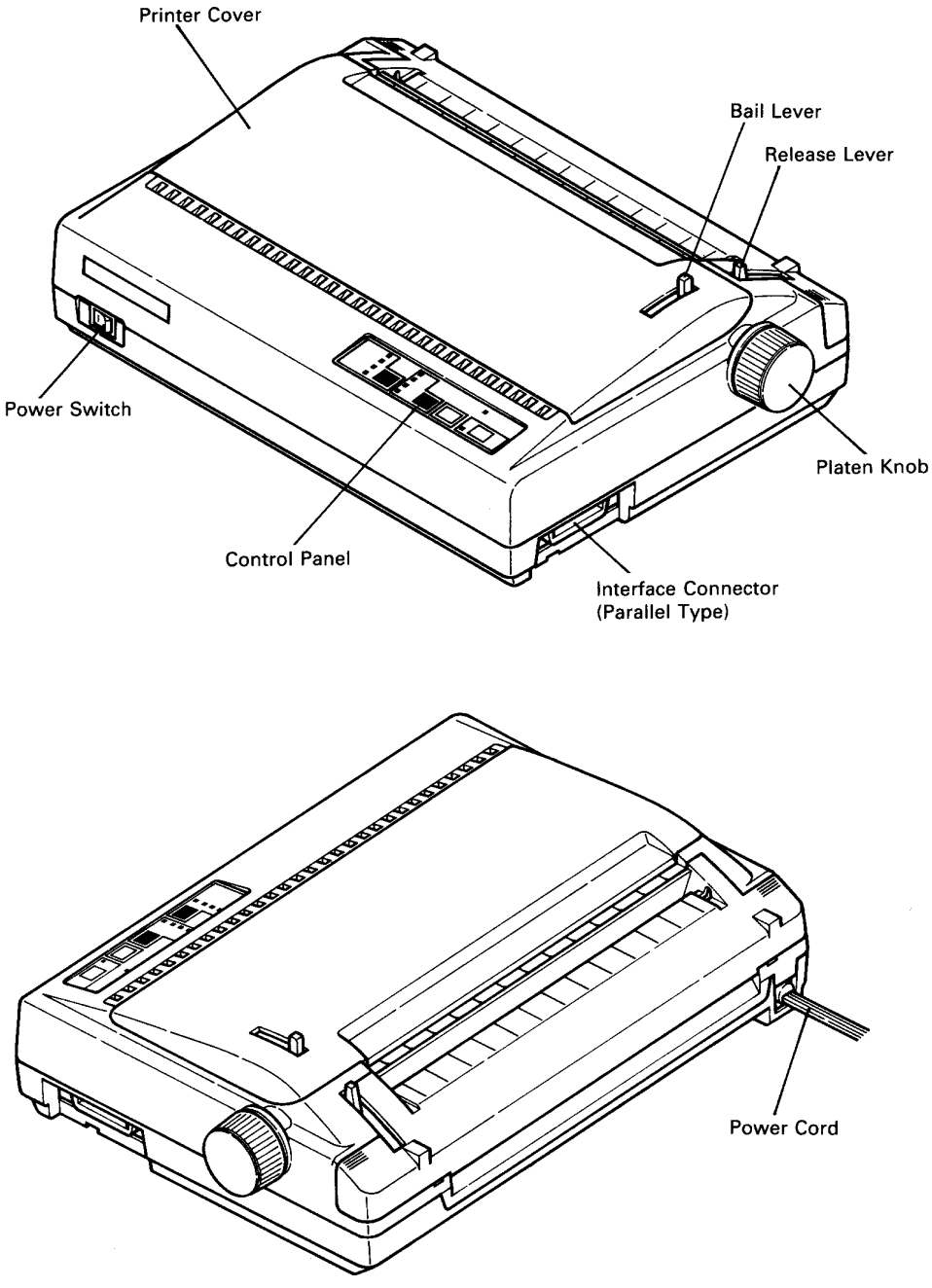


Fig. 1-2 Front and rear views of the printer

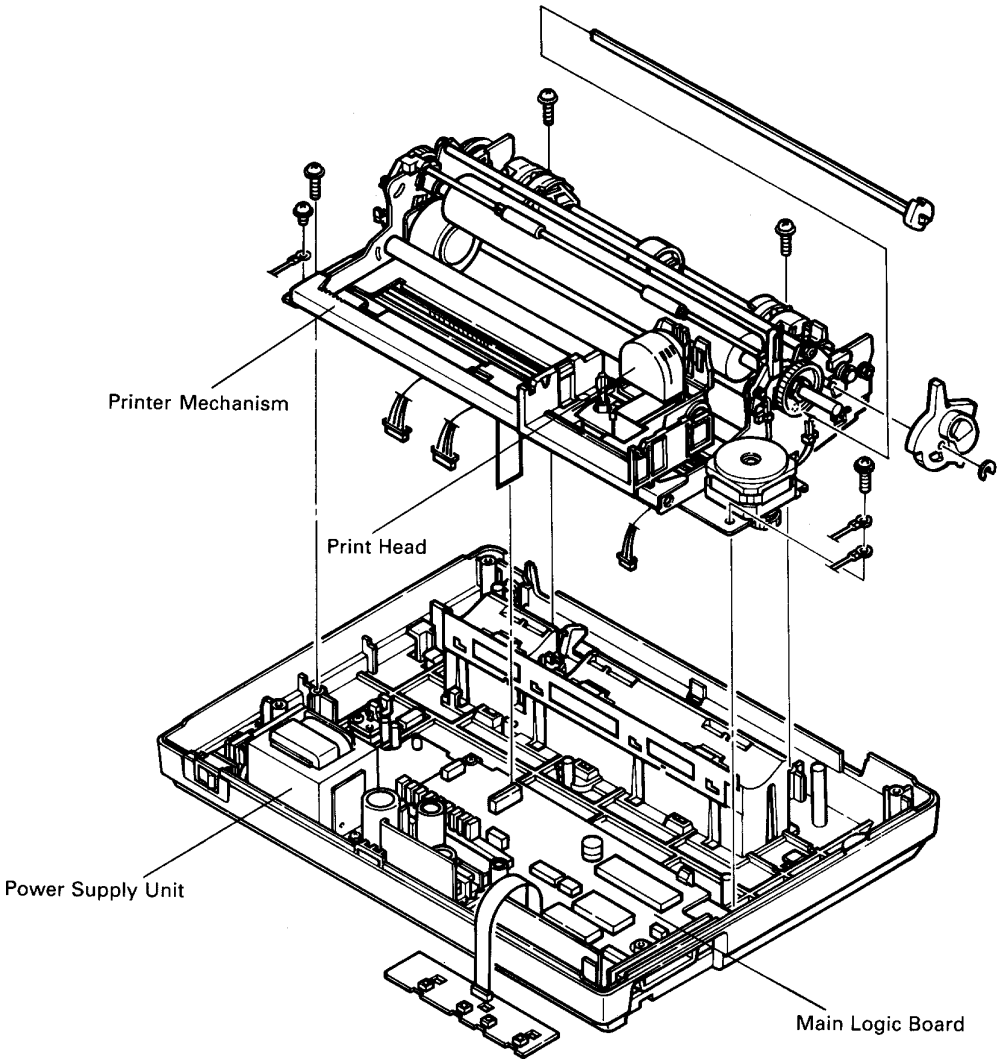
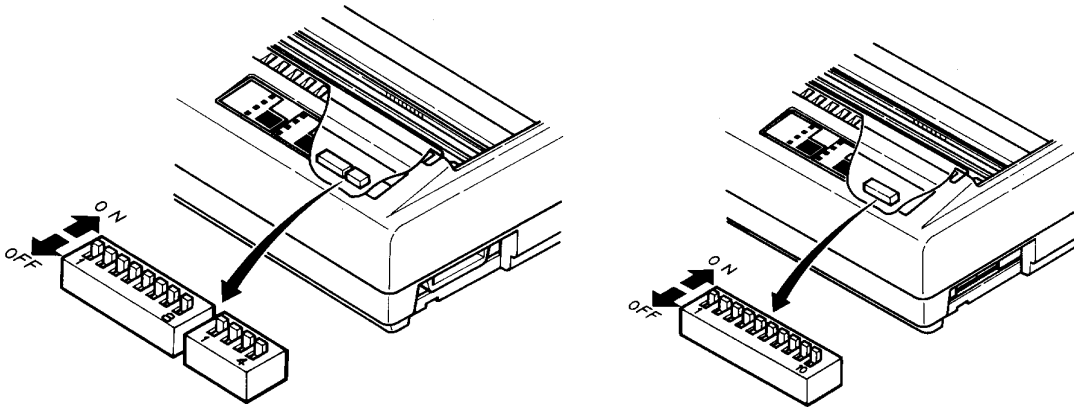


Fig. 1-3 Diagram of Internal Composition

2-2. DIP Switch Settings



Parallel Type Commodore Type

Fig. 1-4 The DIP Switch is located under the Printer Cover

2-2-1. Parallel Type

A. Except for U.S.S.R. market

Switch	Function	ON	OFF	Factory
1-1	Page length	11 inches	12 inches	ON
1-2	Auto CR	Yes	No	ON
1-3	Orator lower case	Small caps	Lower case	ON
1-4	Auto sheet feeder	Inactive	Active	ON
1-5	Paper-out detector	Enabled	Disabled	ON
1-6	Printer mode	Standard	IBM	ON
1-7	Character set (Std. Mode)	Italics	Graphics	ON
	Character set (IBM Mode)	Set #2	Set #1	
1-8	Auto LF	No	Yes	ON
2-1	Usage of RAM	Buffer	Download	ON
2-2	International character set (See right)			ON
2-3				ON
2-4				ON

International character sets:

Country	2-2	2-3	2-4
U.S.A.	ON	ON	ON
France	OFF	ON	ON
Germany	ON	OFF	ON
England	OFF	OFF	ON
Denmark I *	ON	ON	OFF
Sweden	OFF	ON	OFF
Italy	ON	OFF	OFF
Spain I	OFF	OFF	OFF

* Denmark/Norway when switches 1-6 and 1-7 are both OFF.

B. For U.S.S.R. market

Switch	Function	ON	OFF	Factory
1-1	Page length	11 inches	12 inches	ON
1-2	Auto CR	Yes	No	ON
1-3	Character set	Standard	IBM	ON
1-4	Auto sheet feeder	Inactive	Active	ON
1-5	Paper-out detector	Enabled	Disabled	ON
1-6	Printer mode	Standard	IBM	ON
1-7	Character set	Set #1	Set #2	ON
1-8	Auto LF	No	Yes	ON
2-1	Usage of RAM	Buffer	Download	ON
2-2	Italic	OFF	ON	ON
2-3	ESC 4/ESC 5 (*1)	Italic	MSB	ON
2-4	Not used	—	—	ON

*1 The switch 2-3 is valid only in the standard printer mode.

2-2-2. Commodore Type

Switch	Function	ON	OFF	Factory
1-1	Auto LF	Yes	No	ON
1-2	Paper out detector	Enable	Disable	ON
1-3	Device number	No. 4	No. 5	ON
1-4	Page length	11 inches	12 inches	ON
1-5	Operating mode	Commodore	ASCII	ON
1-6	International character set (See right)			ON
1-7				ON
1-8				ON
1-9	Commodore characters	Standard	DIN	ON
1-10	Auto sheet feeder	Inactive	Active	ON

International character sets:

Country	1-6	1-7	1-8
Commodore *	ON	ON	ON
U.S.A.	OFF	ON	ON
Germany	ON	OFF	ON
Denmark I	OFF	OFF	ON
France	ON	ON	OFF
Sweden I	OFF	ON	OFF
Italy	ON	OFF	OFF
Spain	OFF	OFF	OFF

* England (Switch 1-5 is OFF)

3. Connector Signals

3-1. Parallel Interface

Pin No.	Signal Name	Direction	Functional Description
1	$\overline{\text{STROBE}}$	IN	Goes from High to Low (for at least 0.5 microseconds) when data are valid.
2	DATA 1	IN	Eight-bit character data. DATA8 is the most significant bit; DATA 1 is the least significant bit. High is logic 1 and Low is logic 0.
3	DATA 2	IN	
4	DATA 3	IN	
5	DATA 4	IN	
6	DATA 5	IN	
7	DATA 6	IN	
8	DATA 7	IN	
9	DATA 8	IN	
10	$\overline{\text{ACK}}$	OUT	Approx.9-Microsecond Low pulse acknowledges receipt of data.
11	BUSY	OUT	Low when the printer is ready to accept data.
12	PAPER OUT	OUT	Goes High if the printer runs out of paper. Can be held Low permanently by turning DIP switch 1-5 off.
13	SELECTED	OUT	High when the printer is on-line.
14, 15	(NC)		Unused
16	SIGNAL GND		Signal Ground
17	CHASSIS GND		Printer's chassis ground, isolated from signal ground.
18	+5VDC	OUT	External supply of +5V DC.
19 ~ 30	GND		Twisted pair return signal ground level.
31	$\overline{\text{INPUT-PRIME}}$	IN	Low input resets the printer to its power-up condition.
32	$\overline{\text{ERROR}}$	OUT	Goes Low to signal that the printer cannot print due to an error condition.
33	EXT GND		External ground
34, 35	(NC)		Unused
36	$\overline{\text{SELECT-IN}}$	IN	Always High.

3-2. Commodore Interface

Pin No.	Signal Name	Direction	Functional Description
1	$\overline{\text{SRQ}}$	OUT	Not used.
2	GND		Signal ground.
3	ATN	IN	Serial Attention In High..... Signifies the data transfer mode. Low ..... Signifies the command transfer mode.
4	CLK	IN	Serial Clock In The printer begins reading data on the rising edge of this signal.
5	DATA	IN/OUT	Serial Data In/Out IN: Conveys commands and data from the computer to the printer OUT: High indicates printer ready Low indicates printer busy.
6	$\overline{\text{RESET}}$	IN	When this signal level goes low, the printer is initialized and the memory buffer is cleared.

CHAPTER 2
THEORY OF OPERATION

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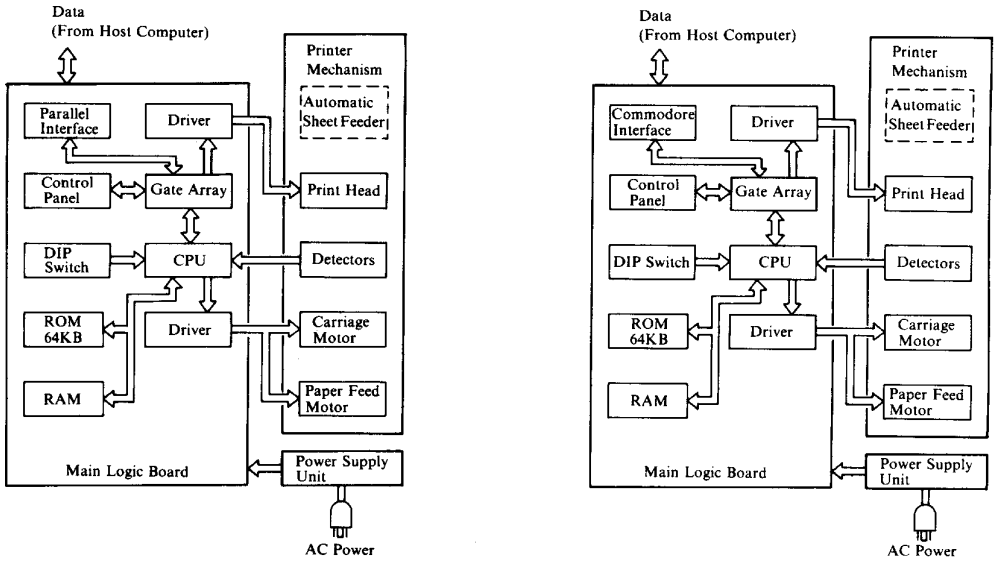
1. Block Diagram

The block diagram of this printer is shown in Fig. 2-1.



Parallel Type Commodore Type

Fig. 2-1 Block Diagram

(1) Main Logic Board

This board receives data from the host computer and stores it in the RAM in the order of arrival. The CPU on this board reads the data from the RAM and edits it according to the program stored in the ROM.

When the editing is completed, various drive signals from the CPU are sent to the printer mechanism to perform printing.

<Explanation>

1 CPU M50734SP
- Controls this printer.

2 ROM µPD27C512 64K-byte
- Contains the program which executes control of the printer.

3 RAM 8K-byte (Monochrome type), 32K-byte (Colour type)
- Used as stack area, work area and data buffer of the CPU.

4 Parallel interface (Parallel type only)

5 Commodore interface (Commodore type only)

6 Gate array (custom IC)
- Inputs or outputs several signals.

7 Driver
- The data edited by the CPU and gate array are sent to the printer mechanism after conversion to the signal for the print head drive, carriage motor drive, and paper feed motor drive respectively.

8 Control Panel Circuit

This panel circuit is for manual operation of the printer.

(2) Printer Mechanism

The printer mechanism consists of a print head, carriage motor, paper feed motor, and detectors.

(3) Power Supply Unit

AC power is converted to DC24V and DC5V.

2. Main Logic Board

2-1. Data Input Operation

2-1-1. Parallel Interface (Parallel type only)

Communications between the host computer and this printer are facilitated via parallel connectors. This section explains the handshake of this interface.
The data input circuit of this interface is shown in Fig. 2-2.

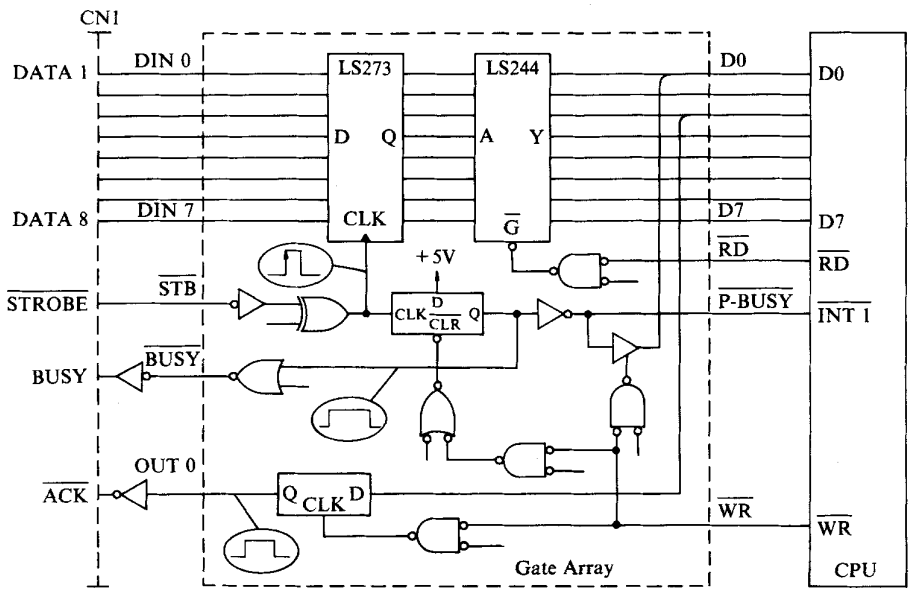


Fig. 2-2 Data Input Circuit with Parallel Interface

The following is an explanation of this handshake.

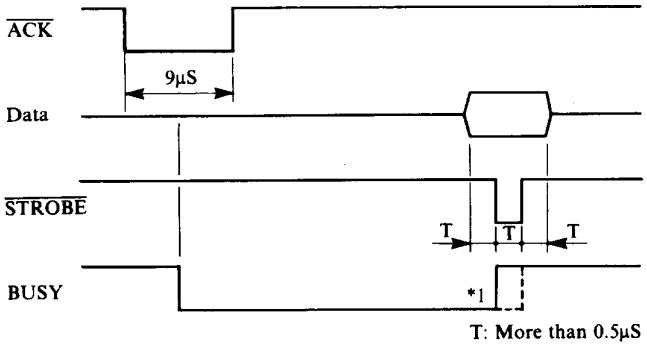
(1) When the BUSY signal is LOW (Ready), the host computer outputs 8- bit data 1 through 8 to the connector CN1. Pin 1 carries the $\overline{\text{STROBE}}$ pulse signal from the host computer to the printer.
This signal is normally held HIGH by the host computer. When the host computer has data ready for the printer, it sets this signal to LOW for at least 0.5 μS.

(2) The gate array of the main logic board reads data 1 through 8 at the time of $\overline{\text{STROBE}}$ signal fall, and then turns the $\overline{\text{BUSY}}$ and $\overline{\text{P-BUSY}}$ signals to low.

(3) When the $\overline{\text{BUSY}}$ signal of the gate array is set to LOW, the BUSY signal of connector CN1 will be turned to HIGH, notifying the host computer that data cannot be accepted.

(4) Ver. 1 Board
When the $\overline{\text{P-BUSY}}$ signal goes LOW, the CPU $\overline{\text{INT1}}$ signal also goes LOW, causing a CPU interrupt.
If such an interrupt occurs in the CPU, set the $\overline{\text{RD}}$ signal to LOW, and read the gate array into the CPU.
Ver. 1.5 Board and Ver. 2 Board
The CPU is informed via the D0 data line that the $\overline{\text{P-BUSY}}$ terminal is LOW. Because of this, set the $\overline{\text{RD}}$ signal to LOW and read the gate array into the CPU.

(5) Upon completion of the data reading, the CPU notifies the host computer of the data receivable state by setting the BUSY signal of connector CN1 and the $\overline{\text{ACK}}$ signal to LOW for a certain period of time.
This concludes the explanation of the parallel interface handshake. The following chart describes the timing chart of the handshake.



*1 Monochrome type
Solid line..... To software version 1.3
Broken line .... From software version 1.4
Color type
Solid line..... To software version 1.2
Broken line .... From software version 1.3

Fig. 2-3 Timing Chart of Parallel Interface

2-1-2. Commodore Interface (Commodore type only)

The commodore interface is a serial interface which can be connected to COMMODORE network host computers. The data input circuit with a Commodore interface is shown in Fig. 2-4.

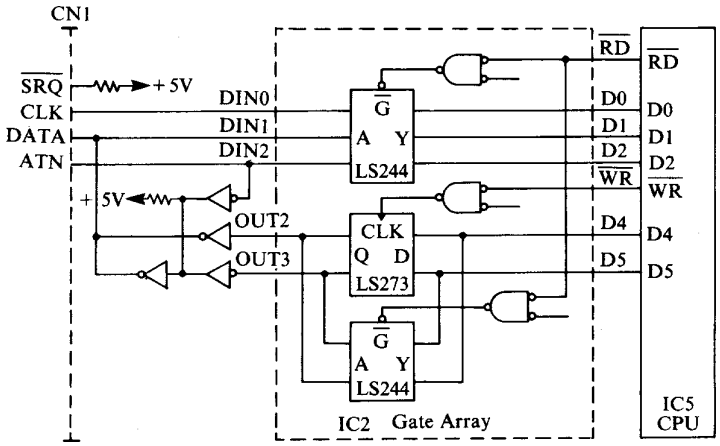


Fig. 2-4 Data Input Circuit with Commodore Interface

Two types of the handshake mode are used with this Commodore interface:
Non-EOI handshake and EOI handshake. The timing chart of the Non-EOI handshake mode is shown in Fig. 2-5, and that of the EOI handshake mode in Fig.2-6.

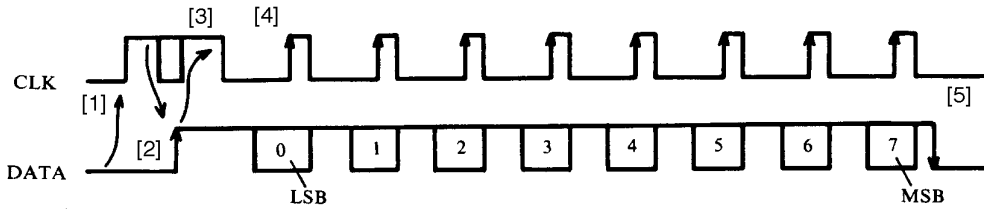


Fig. 2-5 Timing Chart of Non-EOI Handshake Mode

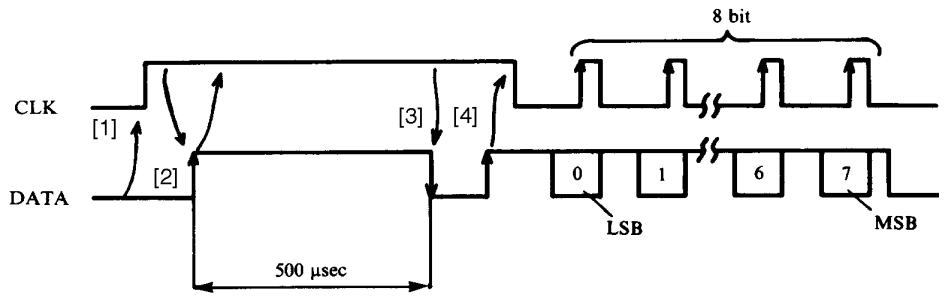


Fig. 2-6 Timing Chart of EOI Handshake Mode

(1) Non-EOI handshake

This is a regular data transmission handshake.

1. The host computer acknowledges that the DATA line is low (data reception is completed), raises the CLK, and notifies the printer that the host computer is ready to send (data or commands).
2. The printer sends information to the host computer by raising the DATA line to show that the printer is ready to receive more data.
3. The host computer sends information to the printer that data is available after the next raising of the CLK, by lowering the CLK.
4. After storing data, the host computer indicates that the data is available by raising the CLK.
   The printer reads the data at the rising edge of the CLK. Then the host computer lowers the CLK and opens the DATA line, acknowledging that the printer is in READY mode (DATA line is high), and moves to the next bit handshake.
5. Sending 8-bit data is the same as above. When transmission is completed, the printer sends information to the host computer that the receiving of data is finished by lowering the DATA line.

(2) EOI handshake

This handshake is used to show that the next data bytes are the last data.

1. The host computer acknowledges that the DATA line is LOW (receiving data is finished), and sends information to the printer that the host computer is ready to send data (including commands) by raising the CLK.
2. The printer sends information to the host computer that the printer is ready to receive data by raising the DATA line.
   At the rising edge the 500 µs timer starts.
   (Until now this has been operating the same as the Non-EOI handshake.) From the starting of the timer, the host computer keeps the CLK high for more than 500 µs to indicate EOI.
3. If the CLK does not fall within 500 µs, the printer acknowledges the EOI, and lowers the DATA line to LOW.
4. The printer sends information to the host computer that it is ready to receive data by raising the DATA line again.
   To send 8-bit data, follow the preceding Non-EOI handshake procedure.

2-2. General Flow Chart

A general flow chart of editing and printing operations is presented in Fig. 2-7.

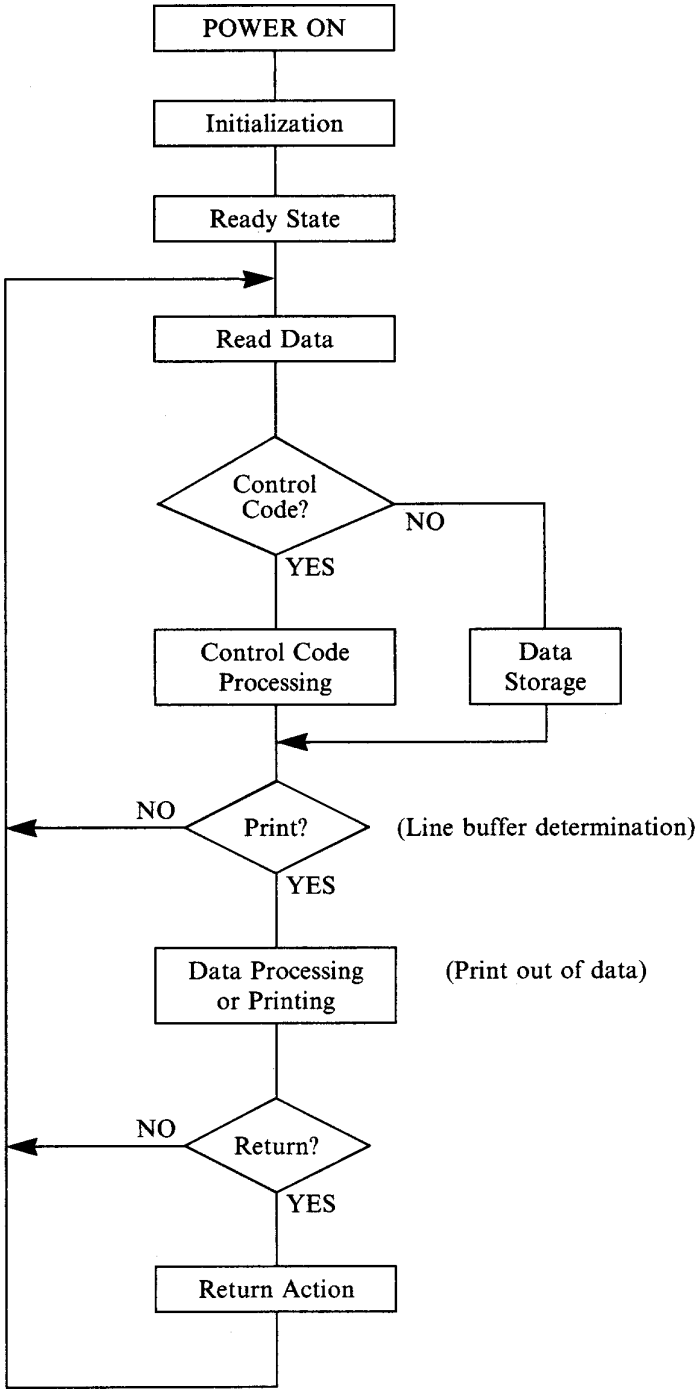


Fig. 2-7 General Flow Chart of Editing and Printing

2-2-1. Editing

Data stored in the RAM is read out sequentially by the CPU and then edited according to a function code that has been specified in advance.
This editing takes places until the CR or CR + LF code appears or the line buffer becomes full.

2-2-2. Print Head Driving Circuit

Edited print data is output to terminal Q of LS273 in the gate array through the CPU data bus, as regulated by the issue timing of a $\overline{WR}$ signal. However, as for pin 9 (HD9) of the print head, the data is output to the same terminal upon issue of the next WR signal. When all the data is received for printing, an energized time control signal is output from port PO4 of the CPU. This allows the print data to be output to HD-1 ~ 9 of the gate array. When the print data is HIGH, the transistor TR9 will be turned ON for 380 μS (Ver 1 and 1.5), 340 μs (Ver 2), energizing the print head solenoid to drive the print head.

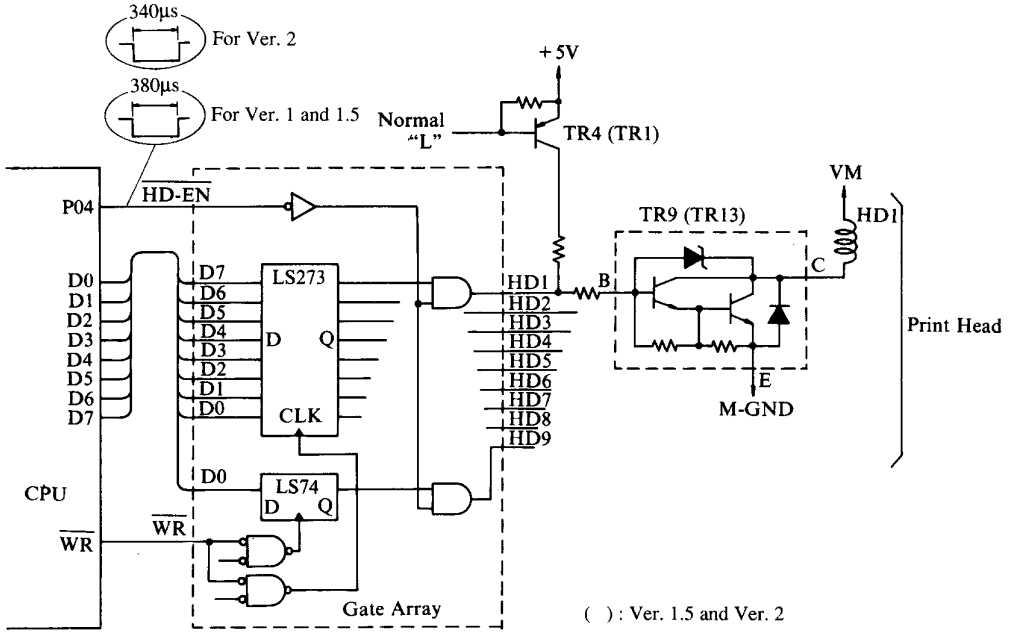


Fig. 2-8 Print Head Driving Circuit

2-2-3. Carriage Motor Driving Circuit

This printer employs a stepping motor as the carriage motor. Unlike regular motors on the market, this stepping motor will not operate just by connecting it to a power source. The motor operates only when a drive pulse is fed to it, but even then, it turns only a certain angle.
This stepping motor is characterized by 4-phase stepping. Control of the motor is facilitated by phase 1-2 excitation. The following is the description of the carriage motor drive circuit and the control signal generated by the phase 1-2 excitation method.

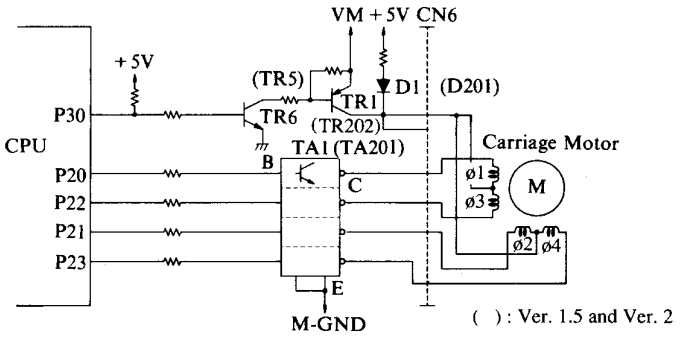


Fig. 2-9 Carriage Motor Driving Circuit

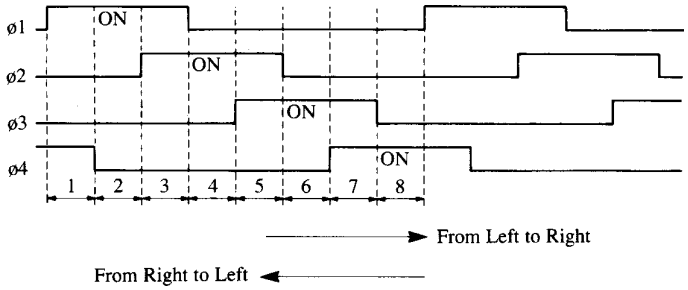


Fig. 2-10 Carriage Motor Driving Signals

The utilization of voltage applied to the carriage motor is described below:
Voltage applied to the carriage motor is changed by setting port P30 of the CPU to HIGH or LOW and by turning transistors TR6 and TR1 ON or OFF.
When TR1 is ON, +24V is supplied to the carriage motor and when TR1 is OFF, +5V is supplied to the motor via diode D1.

Mode	Voltage	Application
Operation:	+24V	Motor Drive
Standby:	+5V	Holding Bias

2-2-4. Carriage Motor Speed Control

Since the carriage motor is a stepping motor, the carriage can be stopped at a desired position by controlling acceleration and deceleration. The carriage can also move backward.
The rotational speed of the carriage motor is set by the number of pulses per time unit. The character pitch (horizontal character size) in each print mode is determined by changing this rotational speed (or carriage transfer speed).

(1) At start-up of the motor:
The number of pulses input to the motor increase in steps (36 altogether), reaching a certain frequency.

(2) To stop the motor:
The number of pulses input to the motor decreases in steps (36), in order to gradually bring the motor to a halt.

(3) When printing is carried out:
Pulses of a uniform pulse width are supplied for printing.

2-2-5. Paper Feed Motor Driving Circuit

Again, a stepping motor is employed as the paper feed motor, which turns a certain angle only when a drive pulse is received. This 4-phase stepping motor is controlled by the phase 1-2 excitation method. The following is the description of the paper feed motor drive circuit and the control signal generated by the phase 1-2 excitation method.

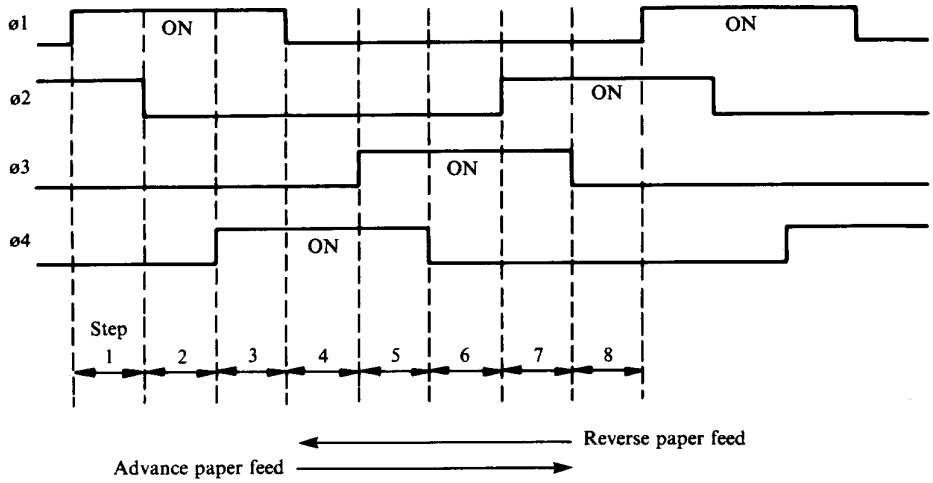


Fig. 2-11 Paper Feed Motor Driving Circuit

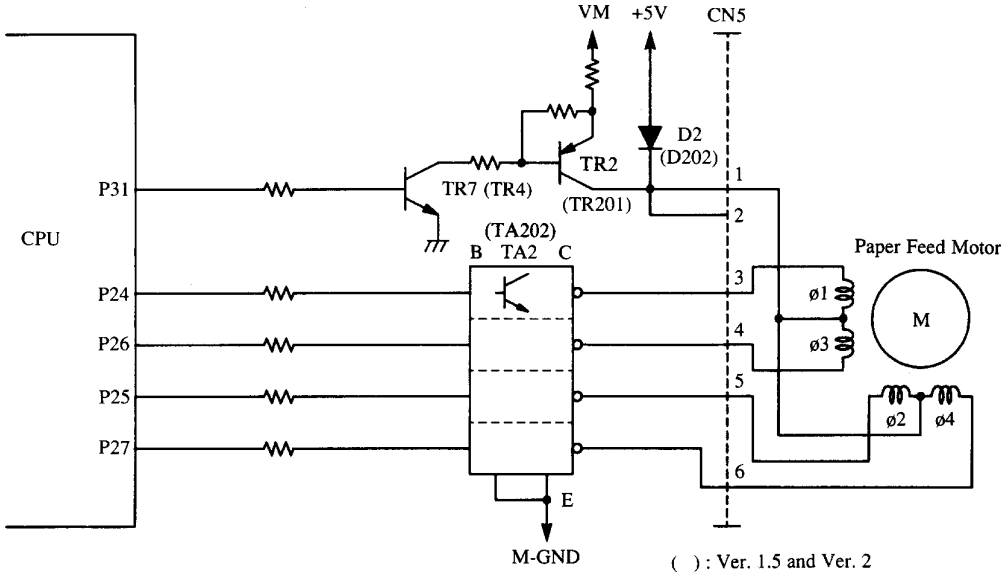


Fig. 2-12 Paper Feed Motor Driving Signals

The utilization of voltage applied to the paper feed motor is described as follows.

Mode	Voltage	Application
Operation	+24V	Motor Drive
Standby:	+5V	Holding Bias

Voltage to the paper feed motor is changed by setting CPU port P31 to LOW or HIGH and by turning transistors TR7 and TR2 ON or OFF.
When TR2 is turned on, +24V is applied to the paper feed motor.
When TR2 is turned off, +5V is supplied to the motor via diode D2.

2-3. Reset Circuit

The RESET signal initializes the circuit elements and prevents operation errors when the power is turned on.
The RESET signal is output for approx. 34ms. when the power is turned on, or while the RESET ($\overline{\text{INPUT-PRIME}}$) signal is being output from the host computer.

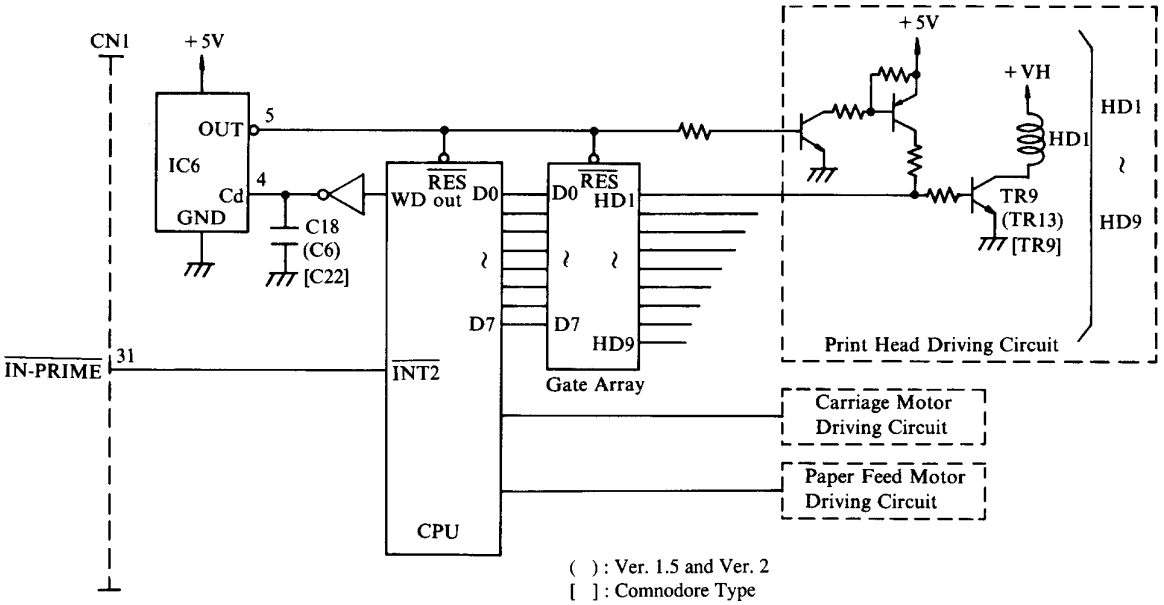


Fig. 2-13 Reset Circuit and Protection Circuit.

- Power On Reset

1 When the power is turned on, the RESET signal output from Pin 5 of IC6 (M51953BL) for approx. 34 msec. This time length is determined by external capacitor C18 (0.1μF), and it can be calculated by the following formula.
$T = 0.34 \times C18\ (pF)\ \mu sec.$

2 This LOW signal triggers RESET command to the CPU and the RESET terminal ($\overline{\text{RES}}$) of the gate array.
3 Resetting the CPU and the gate array will ignore all the drive signals for the carriage motor, the paper feed motor and the print head, preventing operation errors at power ON.

- Reset by Input Prime Signal from Host Computer

1 The input prime signal from the host computer is output to pin 31 of the connector CN1.
2 This output signal will set the terminal $\overline{\text{INIT 2}}$ of the CPU to LOW, executing interruption. Then, the CPU will be initialized.

2-4. Reset by +5V Line Voltage Detection

A voltage-detecting IC (IC6 in Fig.2-13) detects momentary drops in voltage or unstable voltage supply (due to power failures, etc.) on the +5V line. If the voltage on the +5V line falls below 4.25V, the RESET signal appears at the output terminal of the voltage-detecting IC.

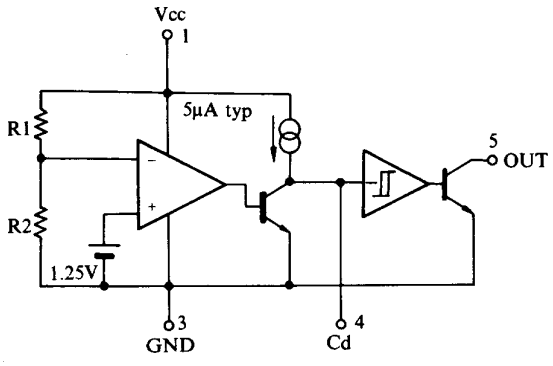


Fig. 2-14 Equivalent Circuit of Voltage-Detecting IC

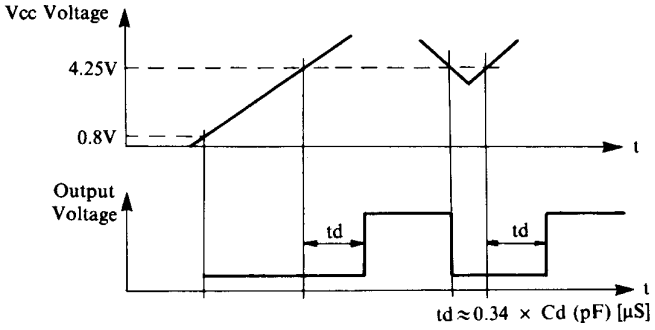


Fig. 2-15 Operational Timing Chart

2-5. Protection Circuit

This printer is provided with a protection circuit which shuts off the print head and motor driving circuits in the event of a CPU malfunction. (Refer to Fig.2-13)

The CPU normally outputs a LOW level signal from the terminal (WD OUT).
However, if the CPU malfunctions, it can not output this signal.

When the LOW level signal is not output from the CPU, the input terminal (Cd) of the voltage-detecting IC goes to LOW and the RESET signal is output from the output terminal (OUT) of the voltage-detecting IC. By this signal, the CPU and the gate array are reset and the print head, the carriage motor and paper feed motor driving signals are ignored, protecting the printer from the CPU runaway.

3. Power Supply Unit

The power supply circuit converts the incoming AC power to DC voltages, +5V and +24V.

Voltage	Tolerance	Application
+24V	DC24V±5%	To drive print head, carriage motor, paper feed motor.
+5V	DC5V±2.5%	To supply power to CPU, ROM, RAM, TTL and ICs and to retain carriage motor and paper feed motor.

4. Mechanism

4-1. Print Head Mechanism

The print head consists of 9 needle wires and 9 print solenoids.

The following explains how each needle wire operates during printing.

(1) When the print solenoid is energized, the clapper is attracted by the iron core and the needle wire is driven toward the platen.

(2) This needle wire hits the platen via the ink ribbon and paper. A single dot is printed on the paper.

(3) When the print solenoid is de-energized, the needle wire is returned to its original position by rebound energy and spring and clapper holder (leaf spring) force.

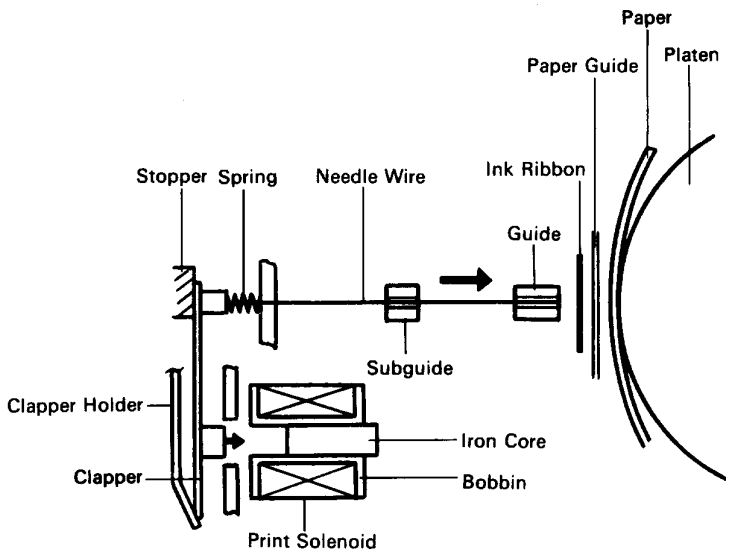


Fig. 2-16 Outline of Print Head Mechanism

4-2. Print Head Carrying Mechanism

The print head carrying mechanism consists mainly of a carriage, timing belt, carriage motor, and home position detector.

(1) Carriage

The carriage is supported horizontally by means of the carriage stay and rear angle, and it moves from side to side with the print head mounted above it. A timing belt is clamped to the base of the carriage and a shield plate is mounted at the base for home position detection.

(2) Timing Belt

The timing belt is suspended between the timing pulley of the carriage motor and the timing pulley of the tension lever, and it maintains a constant tension.

The timing belt is also clamped to the base of the carriage so that it can move the carriage accurately with driving force from the carriage motor.

(3) Carriage Motor

The carriage motor is a PM (Permanent Magnet) type, four-phase and 48-pole pulse motor, which is driven by pulse signals from the control circuit. The rotational rate depends on the number of pulses per unit time. By varying this rotational rate (that is, the carriage carrying rate), the size of the horizontal letters can be changed in each print mode.

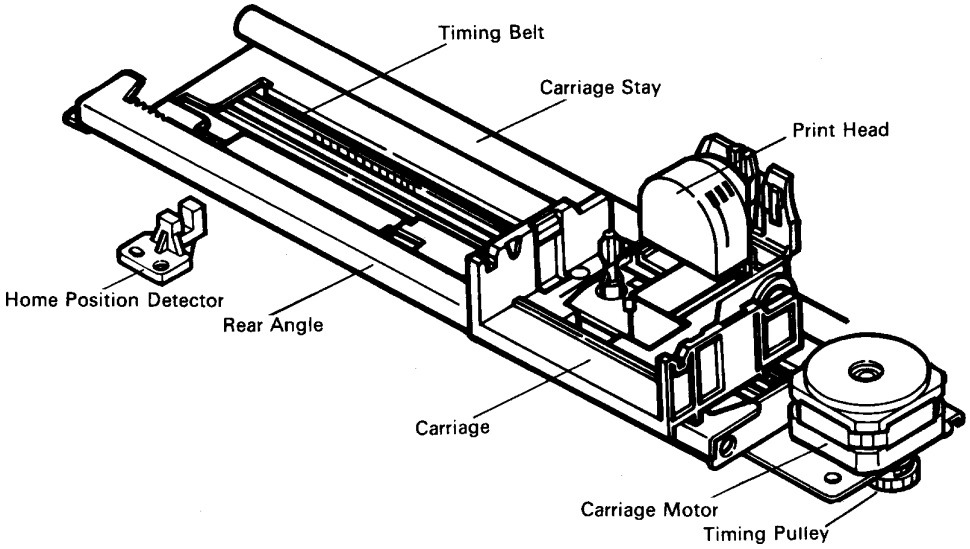


Fig. 2-17 Print Head Carrying Mechanism

4-3. Ink Ribbon Feed Mechanism

The ink ribbon feed mechanism is linked to the print head carrying mechanism described previously so that the ink ribbon is wound up automatically while the carriage moves left or right.

The ribbon feed mechanism is driven by torque from the carriage motor, and carriage movement allows the idler gear to rotate.

This rotation is conveyed sequentially to the gears that work to wind the ribbon. The carriage is equipped with a clutch lever so that the direction of cassette gear rotation remains constant regardless of the direction of the idler gear rotation.

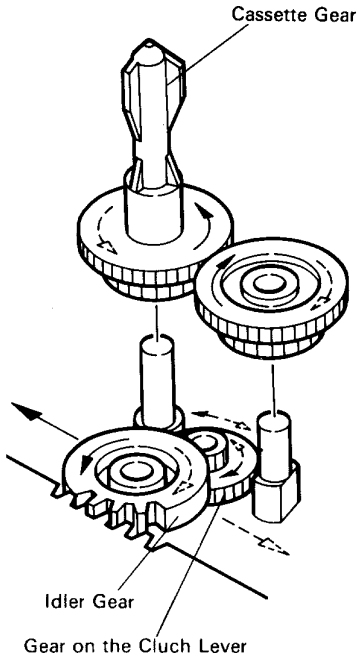


Fig. 2-18 Ribbon Feed Mechanism

4-4. Paper Feed Mechanism

The paper feed motor is a PM type, four-phase and 48-pole pulse motor.
Minimum paper feed is set at 1/216 inch.
There are two ways of feeding paper available with this printer: Friction method and Tractor method. You can select one of the two methods, using the release lever.

Position of release lever	[1]	[2]
Linkage between tractor gear and tractor clutch	Not	Linked
Platen roller and holder roller	Pressured	Not
Release lever position detector	Closed	Open
Paper feeding method	Friction	Tractor

(1) Friction Method

Friction method is selected when the release lever is position [1].
With this method, paper is pressed between the platen roller and the holder roller therefore, paper is fed as the rollers turn.
As the paper feed motor is driven, the motor gear, through the idler gear, turns the platen gear in the paper feeding direction. However, since the tractor gear and the tractor clutch are not linked at this time, the tractor unit will not be driven.

(2) Tractor Method

Tractor method is selected when the release lever is position [2].
As described below, paper feeding is facilitated by rotation of the sprocket pin of the tractor unit. When the tractor method is selected, the tractor gear is linked to the tractor clutch, enabling the drive force generated by the paper feed motor to be transferred to the tractor unit via the idler gear and the platen gear.

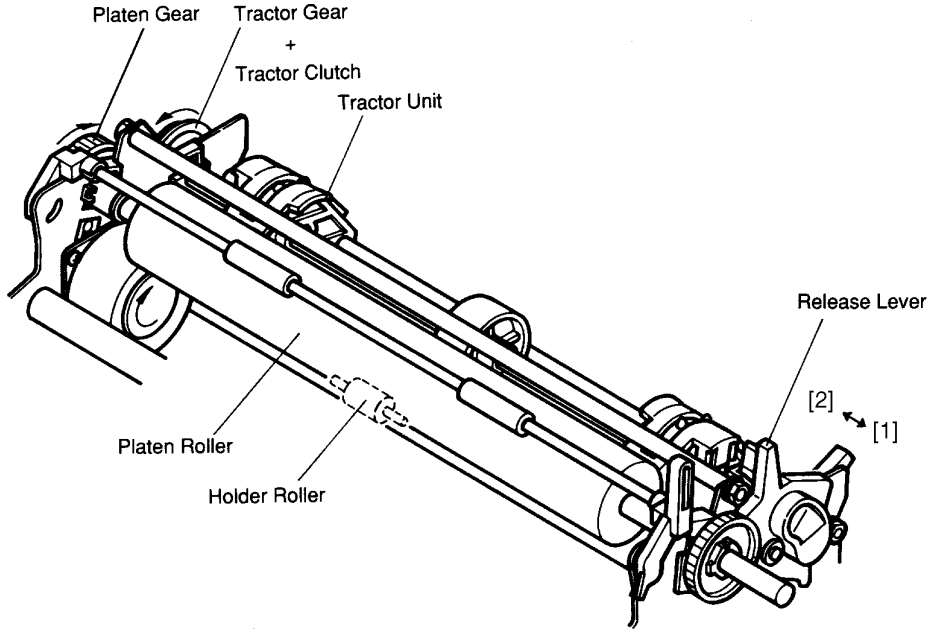


Fig. 2-19 Paper Feed Mechanism

4-5. Detectors

(1) Home Position Detector

A photo-interrupter is used in the home position detector, which is set at the left side of the frame unit. ON/OFF signals are generated according to the position of the shield plate mounted at the base of the carriage, and the printing position is determined by these signals.

(2) Paper Out Detector

A paper out detector is located at the paper insertion slit. When paper is present, the reed switch of the sensor is OPEN. As soon as paper runs out, the switch is set to CLOSE, outputting a paper empty signal.

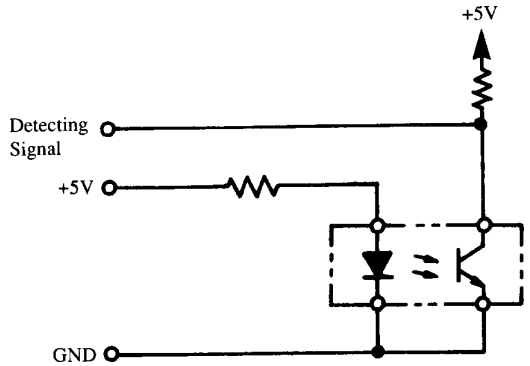


Fig. 2-20 Home Position Detector

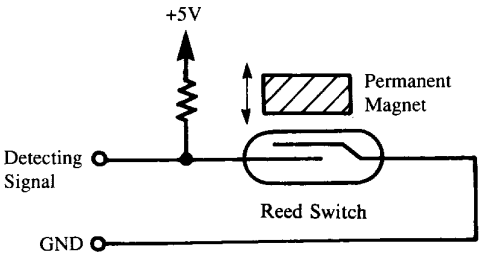


Fig. 2-21 Paper Out Detector

(3) Bail Lever Position Detector

Upon detecting the position of the bail lever, the auto loading operation will be activated. The leaf switch is open when the bail roller is in contact with the platen roller, and it is closed when the bail roller is separated from the platen roller.

(4) Release Lever Position Sensor

The leaf switch is closed when the release lever is in the Friction position, and is open in the Tractor position.

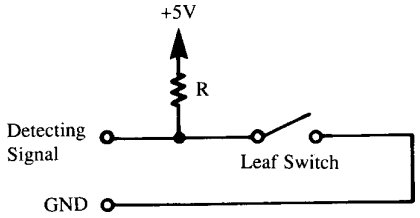


Fig. 2-22 Bail Lever Position Detector

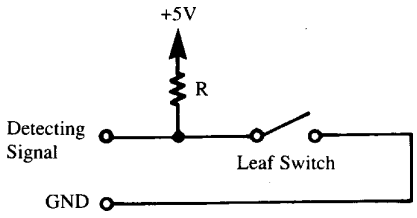


Fig. 2-23 Release Lever Position Detector

CHAPTER 3
ADJUSTMENTS

This printer has undergone various adjustments so that it will achieve standard performance. In this chapter, a brief explanation is given of the methods of adjustments.
Please check this explanation when making maintenance inspections or when replacing parts to correct malfunctions.

3

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3-2. Adjusting Gap Between Home Position Detector and Frame 33

4. Adjustment of Colour Ribbon Holder (Colour Type only) 34

1. Gap Adjustment Between Print Head and Platen

1-1. Measuring Gap Between Print Head and Platen

(1) Remove the upper case unit according to procedures described in chapter 4.
(2) Set the adjustment lever [1] at step two.
(3) Remove the ribbon guide [2].
(4) Insert a thickness gauge [3] between the print head [4] and the platen [5], and measure the gap.
(5) This measurement must be carried out at the center [C].
(6) The standard gap value is 0.30 to 0.40 mm.
(7) If the gap does not lie within this range, adjust it by following the procedure in item 1-2.

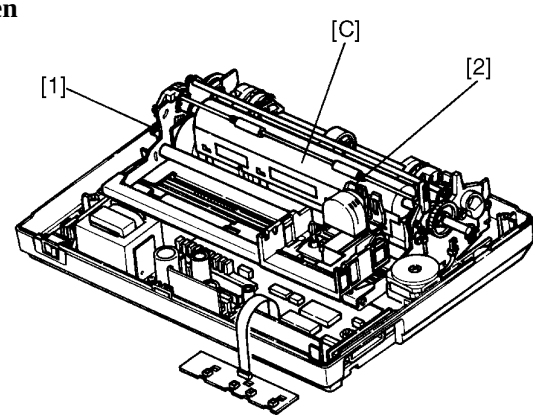


Fig. 3-1 Gap Adjustment

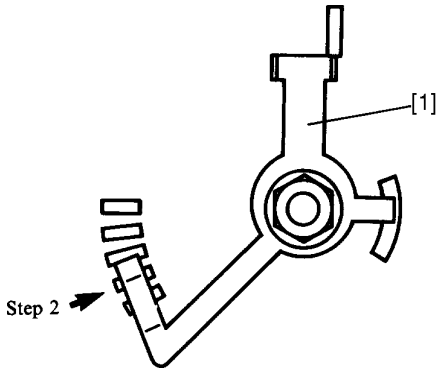


Fig. 3-2 Position of Adjustment Lever

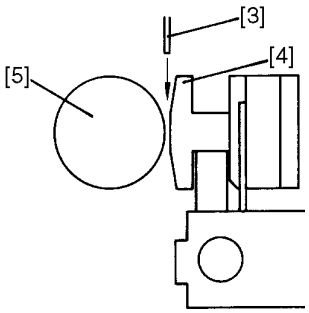


Fig. 3-3 Gap Measurement

1-2. Adjusting Gap Between Print Head and Platen

If the gap does not lie within the standard range, adjust it by carrying out the following procedures.

(1) Remove the printer mechanism according to the procedures described in chapter 4.
(2) Loosen the nut [6].
(3) Insert the shaft in the ø2.5 hole [7].
Adjust the gap by rotating the carriage stay [8] with the shaft.
When the shaft is lowered to the platen side, the gap is reduced, and when lowered to the opposite side, the gap is expanded.
(4) After adjusting, set the adjustment lever [1] to the position shown in Fig. 3-2 and tighten the nut [6].

(Note) When tightening the nut [6], make sure that the carriage stay [8] does not move.

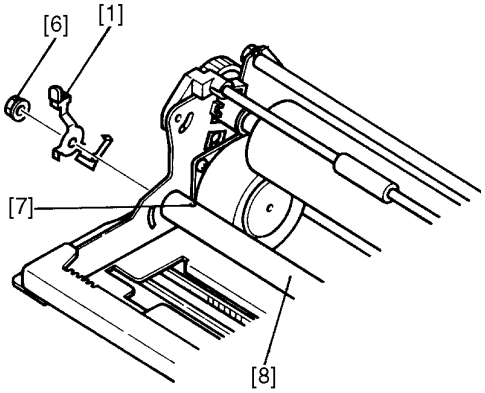


Fig. 3-4 Gap Adjustment

2. Adjustment of Timing Belt Tension

The timing belt tension should be set to 16±2 g for MONO type (20±3 g for CL type).
(The belt tension must be measured with the designated tension gauge [1].)
After the belt has been used for a long time, however, it may be difficult to maintain prescribed tension because of belt deterioration or wear. In these cases, make adjustments by following the procedures listed below.

(1) Remove the upper case unit according to the procedures described in chapter 4.
(2) Move the carriage unit [2] right and left two or three times in order to familiarize yourself with the timing belt [3].
(3) Set the adjustment lever [4] to step 2 as shown in Fig. 3-2.
(4) Move the carriage unit [2] to the right end.
(5) Set the arm [5] of the tension gauge [1] 152 mm from the frame L.
(6) Move the tension gauge [1] in the direction of the platen [6] until it stops. Then place the arm [5] of the tension gauge on the timing belt [3].
(7) Loosen the screw [7].
(8) Insert a flat-blade screwdriver into the square hole of the tension arm [8] and adjust the belt tension by moving the tension arm [8] left or right.
(9) When the belt has been adjusted to the prescribed tension, tighten the setting screw [7].
(10) If the belt cannot be adjusted to the prescribed tension, replace it with a new timing belt [3].

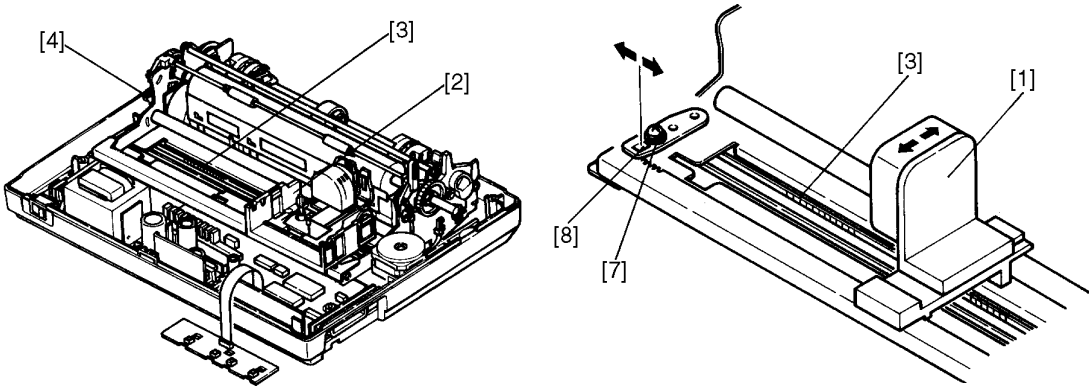


Fig. 3-5 Adjustment of Timing Belt Tension

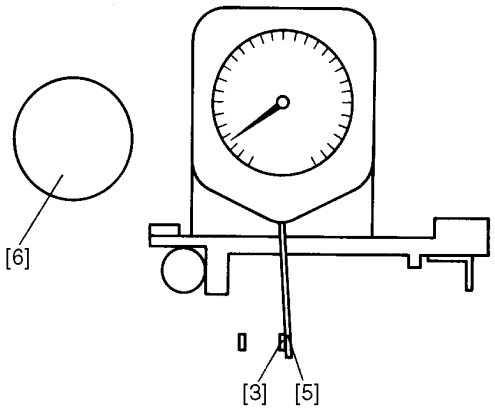


Fig. 3-6 Tension Measurement

3. Adjustment of Home Position (Colour Type only)

3-1. Measuring Gap Between Home Position Detector and Frame

(1) Remove the printer cover [1] .
(2) Measure gap between home position detector [2] and frame [3] .
(3) The standard gap value is 2.4 to 3.0 mm.
(4) If the gap does not lie within this range, adjust it by following the procedure in item 3-2.

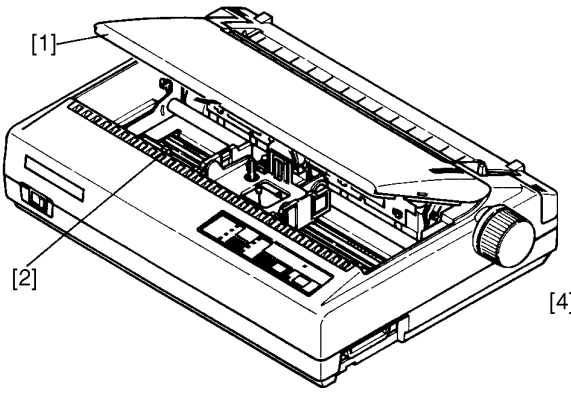


Fig. 3-7 Position of Home Position

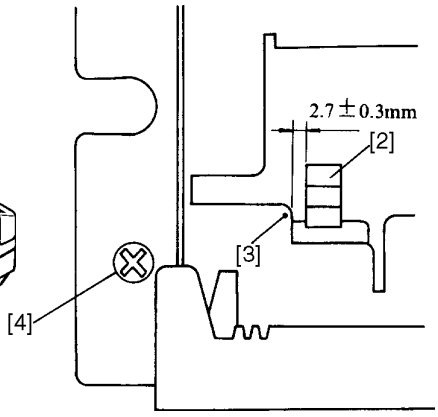


Fig. 3-8. Gap Adjustment

3-2. Adjusting Gap Between Home Position Detector and Frame

If the gap does not lie within the standard range, adjust it by carrying out the following procedures.

(1) Remove the upper case according to procedures described in chapter 4.
(2) Loosen the four screws [4] .
(3) Move the printer mechanism.
(4) Insert the thickness gauge (2.7 mm) between the home position detector [2] , and frame [3] .
(5) Tighten the four screws [4] .

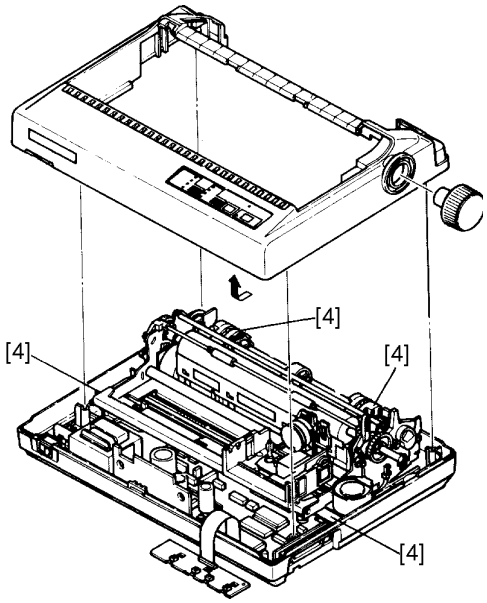


Fig. 3-9 Position of Four Screws

4. Adjustment of Colour Ribbon Holder (Colour Type only)

This adjustment requires use of the carriage unit to fix the position of the color ribbon holder on older parts (see drawings no. 1-24 and 1-25, chapter 7, part 3-3-2). However, newer parts (nos. 1-30 and 1-31) do not require use of the carriage unit.

Adjustment of the colour ribbon holder properly positions the ink ribbon cartridge vertical to the print head when the cartridge is installed on the colour ribbon holder. (Refer to Fig. 3-10.) Failure to perform this adjustment may cause some kinds of defective printing such as printing in "YELLOW" ink when printing should be done in "RED" ink.

The following is the adjustment procedure.

(1) Execute Self Printing [1].
(2) Judging from the print sample printed just now, decide if the ink ribbon cartridge should be moved upward or downward of the print head.
(3) Remove the printer cover and ink ribbon cartridge [1] .
(4) Turn the adjusting screws A [2] and B [3] (brass parts)
    counter-clockwise to move the ribbon cartridge upward.
    clockwise to move the ribbon cartridge downward.
(5) Install the ink ribbon cartridge and printer cover.
(6) Execute self printing.
(7) Check the printing condition on the print sample.
    If additional adjustment is required, repeat the procedure from (2) to (7).

*1 Self printing
1. Insert the paper.
2. With power off, press the On Line switch on the control panel and hold it down.
3. Still holding the On Line switch down, turn the printer's power on.

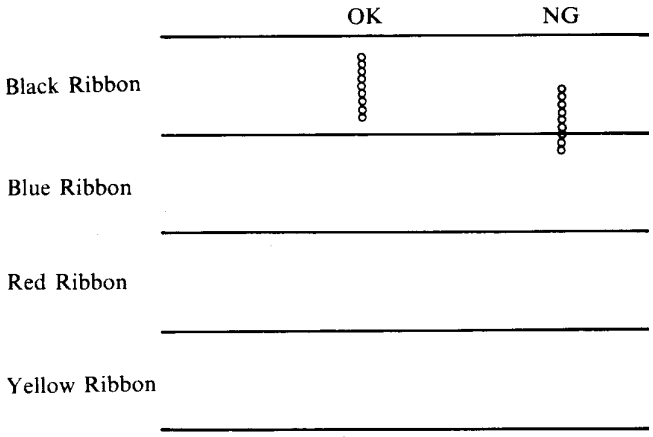


Fig. 3-10 Needle Wire Position of Print Head

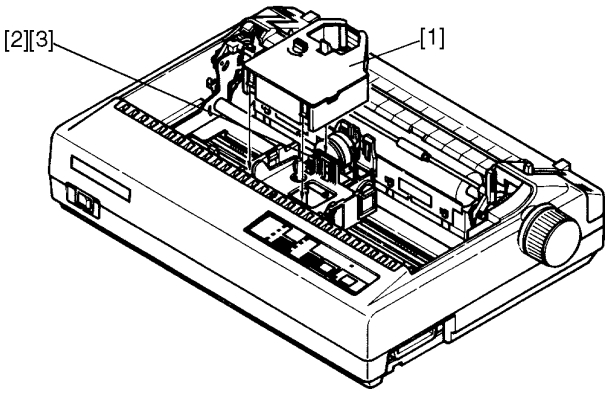


Fig. 3-11 Position of Adjusting Screws

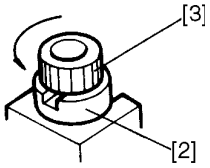


Fig. 3-12 Adjusting of Colour Ribbon Holder

CHAPTER 4
PARTS REPLACEMENT

This chapter explains disassembly and reassembly of the printer.
Note the following precautions during disassembly and reassembly.

1. Disconnect the printer from the wall outlet before servicing it.
2. Assembly is the reverse of disassembly unless otherwise specified.
3. After reassembly, coat the screw heads with locking sealant.
4. Lubrication information is not provided in this chapter. Refer to item 2 in chapter 5.

1. Upper Case Unit 37

2. Printer Mechanism 37

3. Main Logic Board 38

4. Power Supply Unit 39

5. Fuses 40

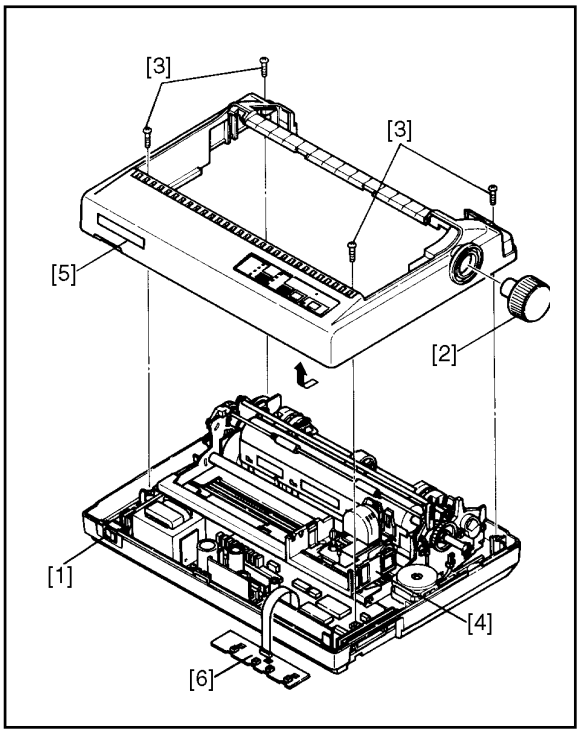
6. Print Head 41

7. Carriage Motor Unit 42

8. Platen Unit 43

9. Tractor Unit 43

10. Detector Unit 44



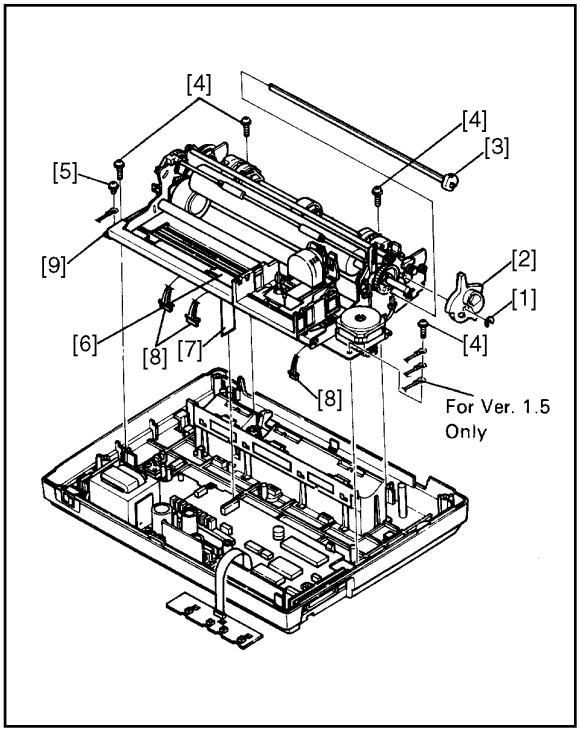
1. Upper Case Unit

(1) Turn off the power switch [1] .

(2) Remove
- Printer cover
- Rear cover
- Platen knob [2]
- Four screws [3]

(3) Move the Carriage Unit [4] over to the right so that it aligns with the cut-out of the upper case unit [5] .

(4) Remove
- Upper case unit [5]
  Clasp the back side of the upper case unit, and gently push it further forward.
- Control panel board [6]

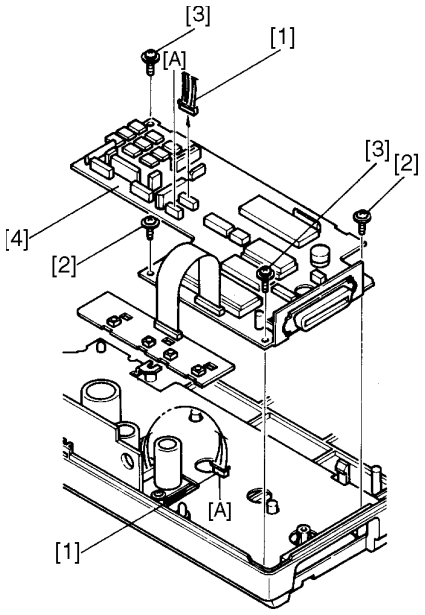


2. Printer Mechanism

(1) Remove
- Upper case unit according to the procedure described in item 1.
- Stop ring [1]
- Release lever [2]
- Gear lever [3]
- Four tapping screws [4]
- Screw [5]
- Connector cover [6]
  Lift up the tab of the connector cover, and slide it to the right for removal.
- Printer head cable [7]
- Three connectors [8]
- Printer mechanism [9]

Caution in assembly:

Align the the Δ mark on the Release lever [2] with the Δ mark on the Release gear [3] to install the Release lever [2] .

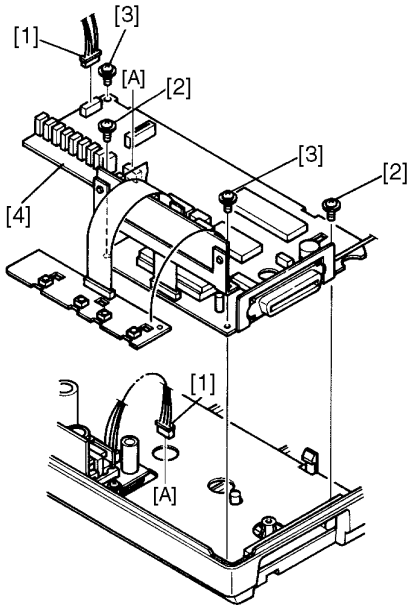


For Ver. 1

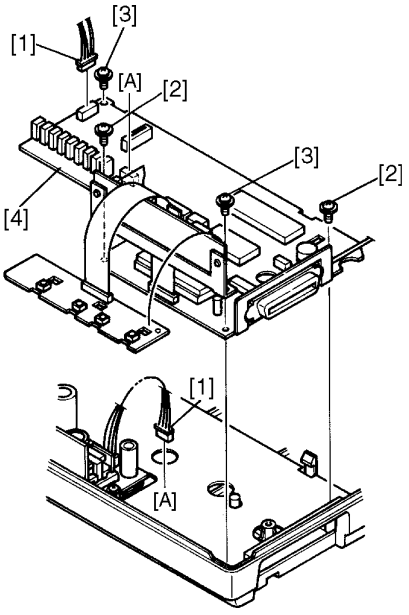
3. Main Logic Board

(1) Remove

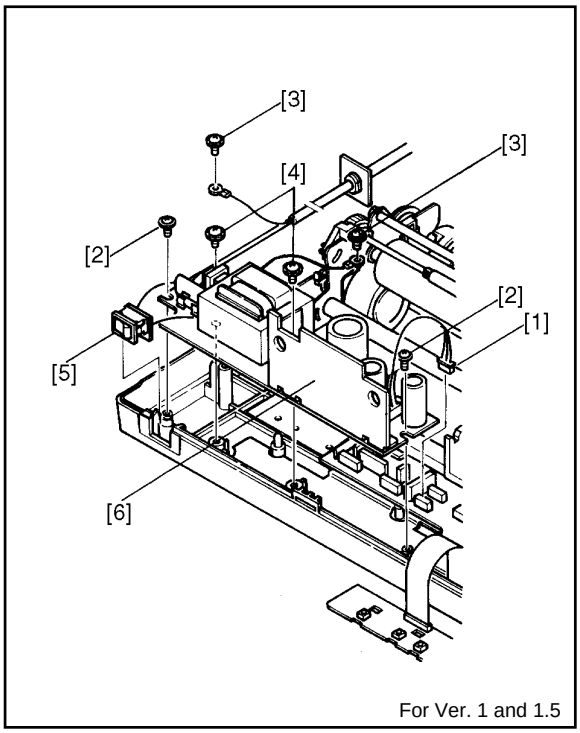
- Printer mechanism according to the procedure described in item 2.
- Two connectors [1]
- Two tapping screws [2]
- Two screws [3]
- Main logic board [4]



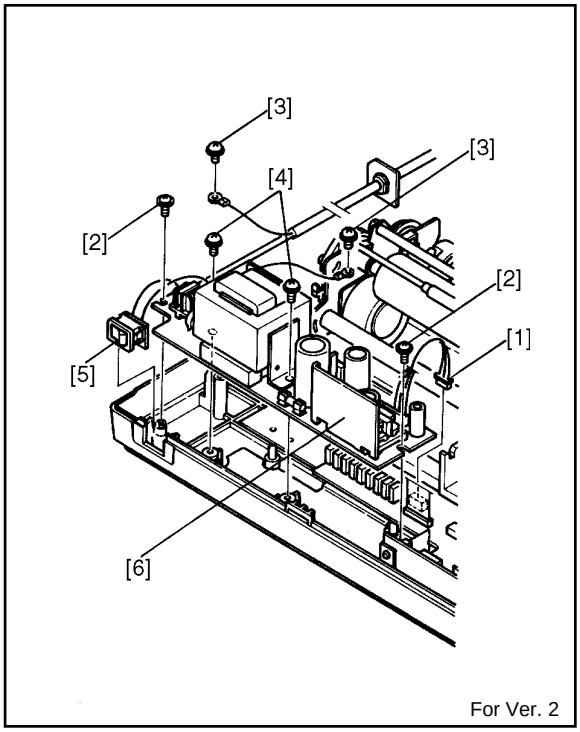
For Ver. 1.5



For Ver. 2



For Ver. 1 and 1.5

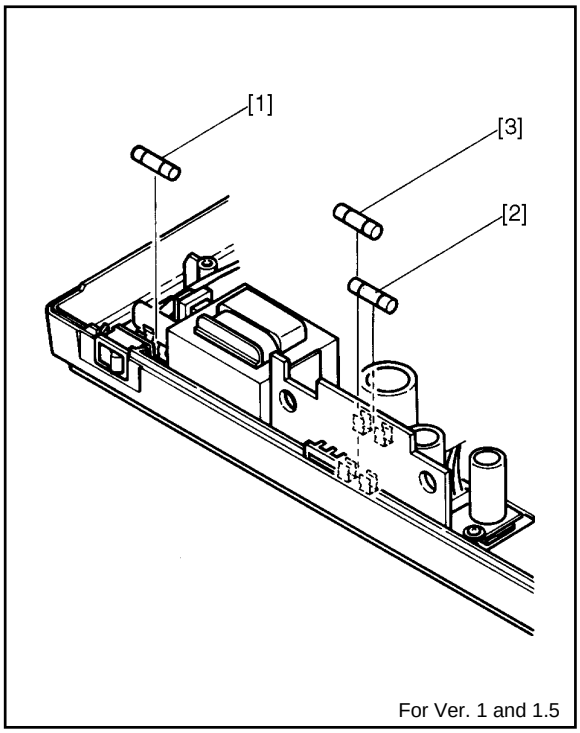


For Ver. 2

4. Power Supply Unit

(1) Remove

- Upper case unit according to the procedure described in item 1.
- Connector [1]
- Two tapping screws [2]
- Two tapping screws [3]
- Two screws [4]
- Power switch [5]
- Power supply unit [6]



For Ver. 1 and 1.5

5. Fuses

For Ver. 1 and Ver. 1.5

(1) Remove
- Upper case unit according to the procedure described in item 1.

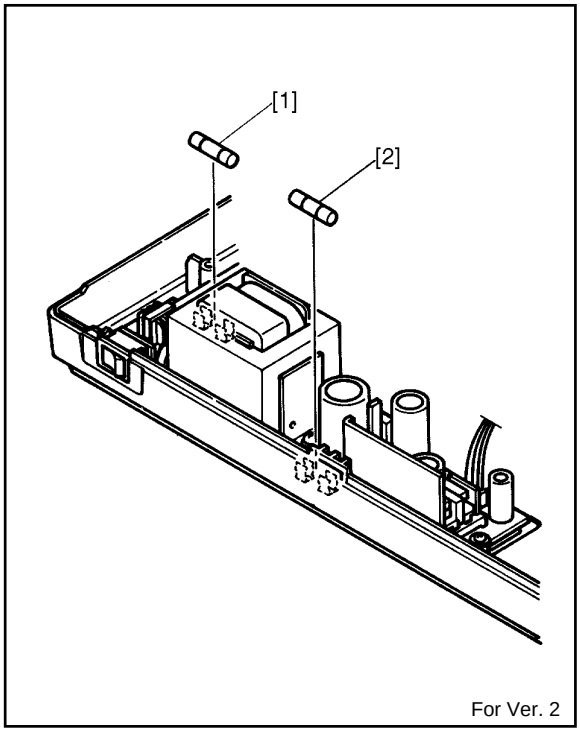
(2) Inspect
- Fuse F1 [1]
- Fuse F2 [2]
- Fuse F3 [3] (For 120V only)

Defective→ Replace fuse as follows:

AC Voltage	F1	(F3)
120V	5TT1A	5MT3.0
220V/240V	630mA	–

The Destination Countries	F2
EC, WG, NBR, SC, SU	EAK2.0
US, TW, HK, UK, AS, MAS, UE	5MT2.0

New fuse blown → Inspect circuit



For Ver. 2

For Ver. 2

(1) Remove
- Upper case unit according to the procedure described in item 1.

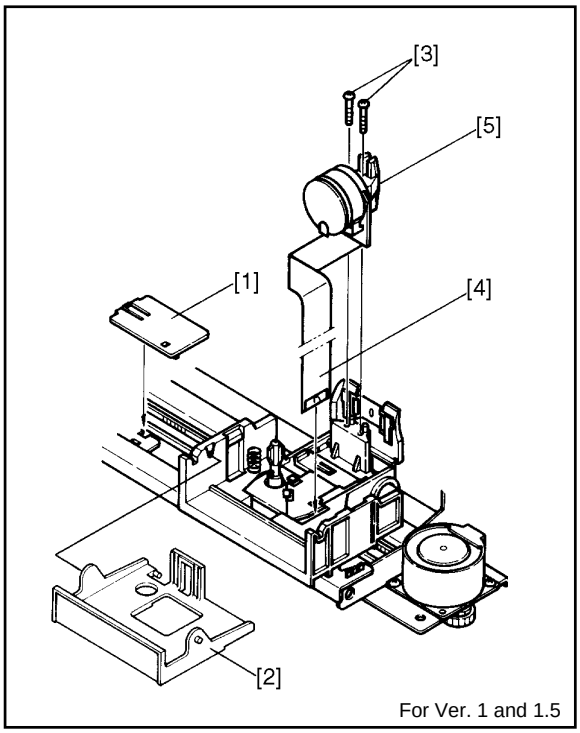
(2) Inspect
- Fuse F1 [1]
- Fuse F2 [2]

Defective → Replace fuse as follows:

AC Voltage	F1
120V	5TT1A
220V/240V	630mA

The Destination Countries	F2
EC, WG, NBR, SC, SU	EAK3.15A
US, TW, HK, UK, AS, MAS, UE	5TT3A

New fuse blown → Inspect circuit



For Ver. 1 and 1.5

6. Printer Head

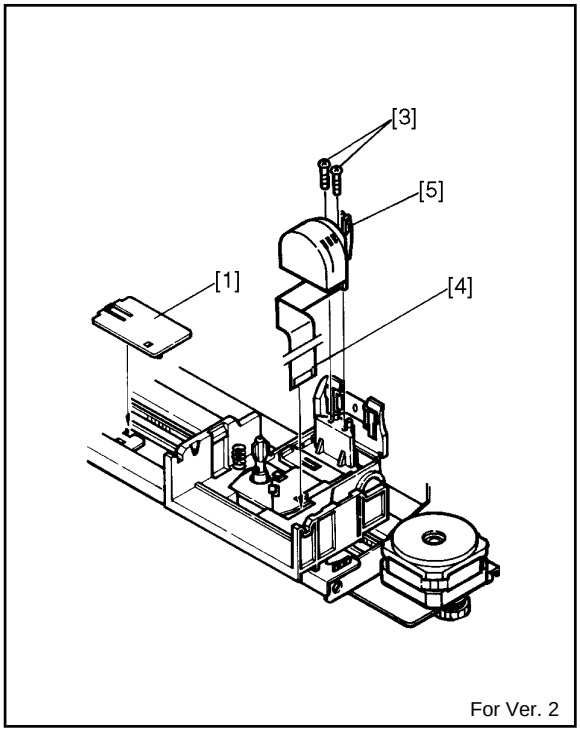
(1) Remove
- Printer cover
- Ink ribbon cartridge
- Connector cover [1]
- Gear Cover [2] (Colour type only)
- Two tapping screws [3]
- Head cable [4]
- Print head [5]

  WARNING:

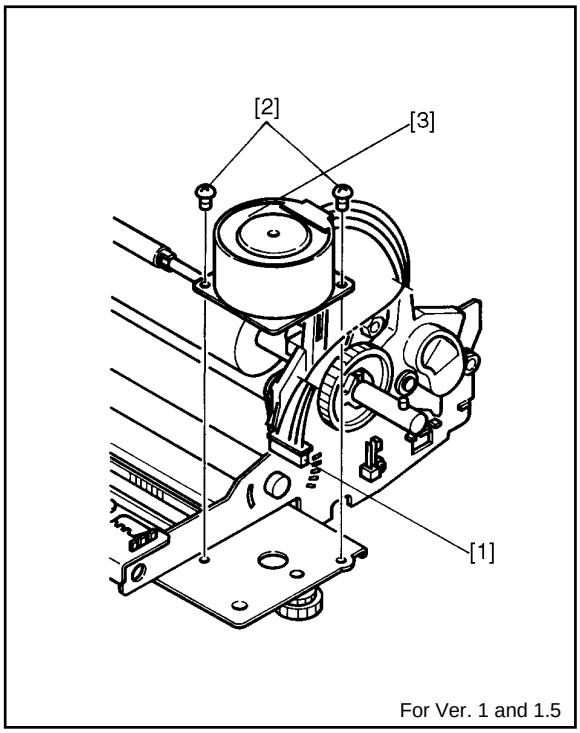
  The print head becomes hot after printing so wait for it to cool before removing it.

(2) Adjust
- Gap between print head and platen

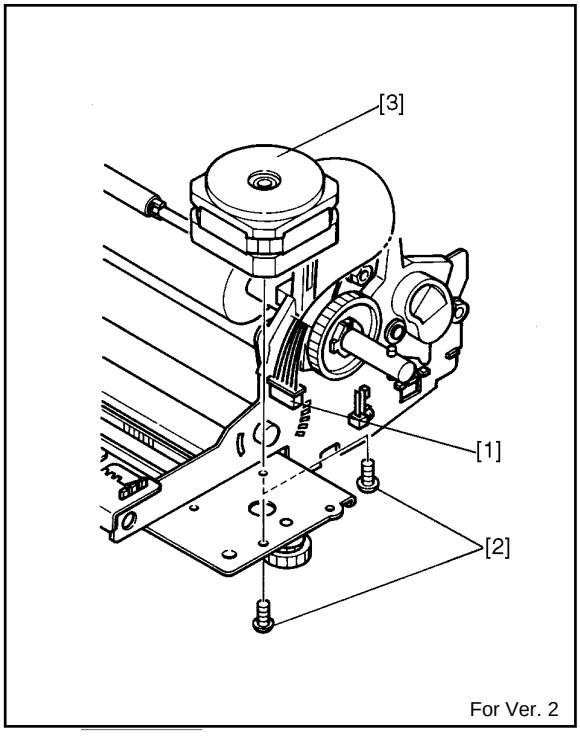
Refer to item 1 of Chapter 3.



For Ver. 2



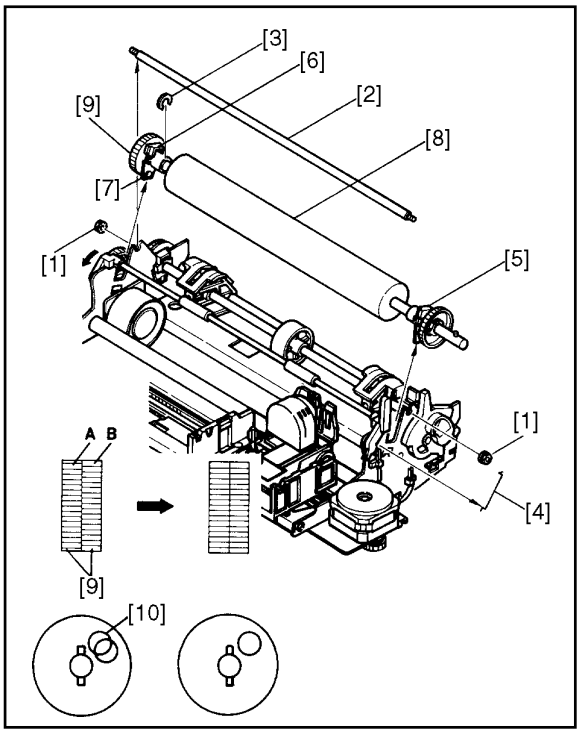
For Ver. 1 and 1.5



For Ver. 2

7. Carriage Motor Unit

(1) Remove
- Printer mechanism according to the procedure described in item 2.
- Cord fastener binding the lead wires
- Connector [1]
- Two screws [2]
- Carriage motor unit [3]



8. Platen Unit

(1) Remove

- Printer mechanism according to the procedure described in item 2.
- Two nuts [1]
- Tractor stay [2]
- Stop ring [3]
- Ground contact spring [4]
- Platen holder R [5]
- Platen holder L [6]

  Lift the tabs [7] of platen holders R and L to allow removal of platen holders R and L from the frame.
- Platen unit [8]

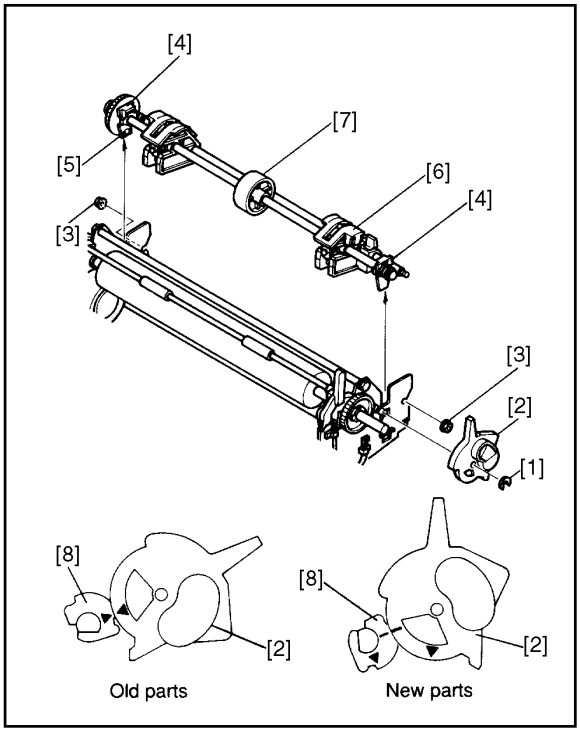
Caution in assembly:

When assembling the platen gear assembly [9] on the idler gear, align the teeth of gear A and gear B (be sure to align the holes [10] in the two gears.)

(2) Adjust

- Gap between print head and platen

Refer to item 1 of Chapter 3.



9. Tractor Unit

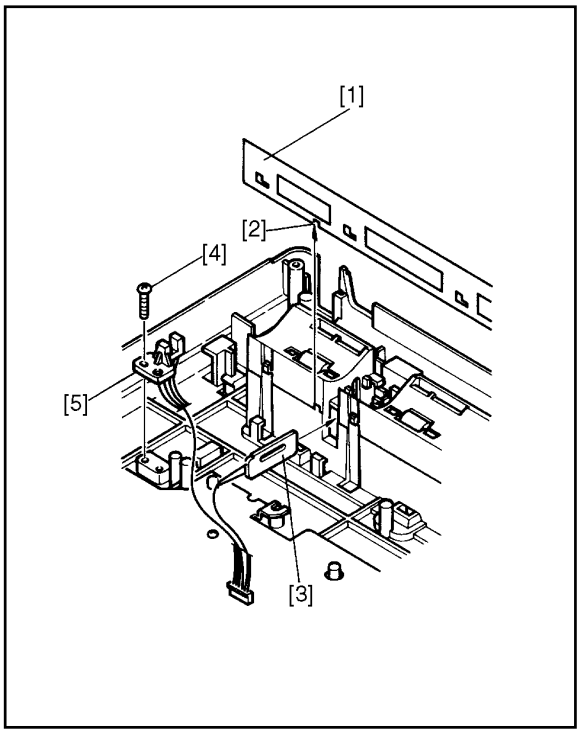
(1) Remove

- Upper case unit according to the procedure described in item 1.
- Stop ring [1]
- Release lever [2]
- Two nuts [3]
- Two tractor bushings [4]

  Lift the tab [5] of the tractor bush to allow removal of the tractor bush from the frame.
- Tractor unit [6]

Caution in assembly:

- For reassembly, hold the sheet guide [7] at the center of the tractor shaft and push the guide into the printer.
- Aligen the mark (▲ or ▮) on the release lever [2] with the mark (▲ or ▮) on the release gear [8] to install the release lever [2].



10. Detector Unit

(1) Remove

- Printer mechanism according to the procedure described in item 2.
- Cord fastener binding the lead wires
- Sub guide [1]
  Lift the notched part [2] and slide sub guide [1] to the left to remove.
- PE detector [3]
- Screw [4]
- Home position detector [5]

CHAPTER 5
MAINTENANCE AND LUBRICATION

1. Maintenance 47

1-1. Cleaning 47

1-2. Checks 47

2. Lubrication 48

2-1. Lubricant 48

2-2. Lubricating Method 48

2-3. Lubricated Areas 48

1. Maintenance

In order to maintain the optimum performance of this printer and to prevent trouble, maintenance must be carried out according to the following items.

1-1. Cleaning

(1) Removal of dirt

Wipe off dirt with a soft cloth soaked in alcohol or benzine.

*Note: Do not use thinner, trichlene or ketone solvents because they may damage plastic parts. Also during cleaning, be careful not to moisten or damage electronic parts, wiring, or mechanical parts.

(2) Removal of dust, pile, etc.

Vacuum cleaning (with an electric cleaner) is preferred. Remove all dust, etc., inside the printer.

*Note: After cleaning, check the oil level. If it is not adequate due to cleaning, replenish it.

1-2. Checks

Checks must be carried out at two levels: “daily check” which the operator can easily carry out during operation, and “periodic check” which an expert should carry out.

(1) Daily check

When the printer is used on a daily basis, check to be sure that the printer is being used properly. Make sure that the printer is operating under the best conditions.

- Is any paper stuck in the paper box or printer case?
- Is the cartridge ribbon set to the right position?
- Is there any foreign matter inside the printer? (Remove.)
- Is the print head getting excessively dirty?

(2) Periodic check

After 6 months or printing 1,000,000 lines, the periodic check and lubrication must be carried out.

- Check for deformation of springs.
- Check the gap between the platen and the print head.
- Remove dust, dirt, etc., from near each detector.

2. Lubrication

Lubrication is very important to maintain optimum performance and to prevent trouble.

2-1. Lubricant

The type of lubricant greatly affects the performance and durability of the printer, especially in a low temperature environment. We recommend use of the grease and lubrication oils listed below for this printer

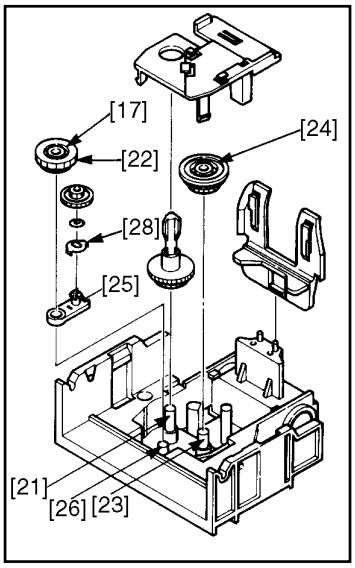
Product name	Maker
FLOIL GB-TS-0 and FLOIL GB-100	Kanto Chemicals Co., Ltd.
KF96-1000CS and KF96-SP	Shinetsu Chemical Industry
Mobil 1	Mobil oil

2-2. Lubricating Method

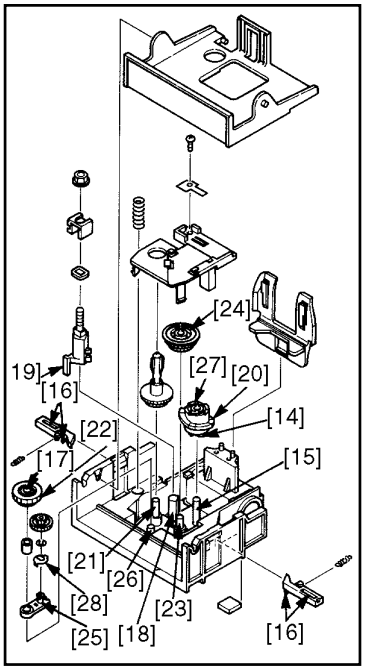
When lubrication is carried out in assembly and disassembly, wash parts well to remove dust and dirt before lubrication. Lubrication must be carried out regularly once every 6 months or after 1 million lines have been printed. Lubrication is necessary irrespective of the regular lubrication whenever lubricant becomes deficient after cleaning or whenever parts have been disassembled or replaced.

2-3. Lubricated Areas

NO.	Lubrication	Product Name
[1]	Rubbing surfaces of idler gear 16 × 72 × 0.5 and idler gear shaft	GB-TS-0
[2]	Rubbing surfaces of gear 40 × 0.5 and gear shaft	GB-TS-0
[3]	Rubbing surfaces of adjusting lever and frame	GB-TS-0
[4]	Rubbing surfaces of timing pulley and pulley shaft	GB-TS-0
[5]	Rubbing surfaces of rear angle and carriage	GB-TS-0
[6]	Rubbing surfaces of bushing and carriage stay	Mobil 1
[7]	Rubbing surfaces of timing pulley and stop ring	GB-TS-0
[8]	Rubbing surfaces of release shaft and frame	GB-TS-0
[9]	Rubbing surfaces of release lever and tractor shaft	GB-TS-0
[10]	Rubbing surfaces of two tractor bushings and tractor shaft	GB-TS-0
[11]	Rubbing surfaces of tractor holder and tractor cover	KF96-1000CS
[12]	Rubbing surfaces of bail roller and shaft	KF96-SP
[13]	Rubbing surfaces of timing pulley and pulley bushing	GB-100
[14]	Rubbing surfaces of lift cam and ribbon change lever	GB-TS-0
[15]	Rubbing surfaces of lift cam and carriage shaft	GB-TS-0
[16]	Rubbing surfaces of ribbon change lever and carriage	KF96-1000CS
[17]	Rubbing surfaces of idler gear 16 × 1 – 40 × 0.3	GB-TS-0
[18]	Rubbing surfaces of lift lever assy and carriage shaft	KF96-1000CS
[19]	Rubbing surfaces of lift lever assy and carriage	GB-TS-0
[20]	Rubbing surfaces of lift lever assy and lift cam	KF96-1000CS
[21]	Rubbing surfaces of ribbon cassette gear and carriage shaft	GB-TS-0
[22]	Rubbing surfaces of rear angle and idler gear 16 × 1 – 40 × 0.3	GB-TS-0
[23]	Rubbing surfaces of idler gear 43 × 6.3 × 0.3 and carriage shaft	GB-TS-0
[24]	Rubbing surfaces of idler 43 × 6.3 × 0.3 and gear cover	GB-TS-0
[25]	Rubbing surfaces of idler gear 17 × 41 × 0.3 and clutch lever	GB-TS-0
[26]	Rubbing surfaces of idler gear 16 × 1 – 40 × 0.3 and carriage shaft	GB-TS-0
[27]	Rubbing surfaces of lift cam and gear cover	GB-TS-0
[28]	Rubbing surfaces of wave washer and poly-slider	GB-TS-0



Detail-B (Monochrome Type)



Detail-B (Colour Type)

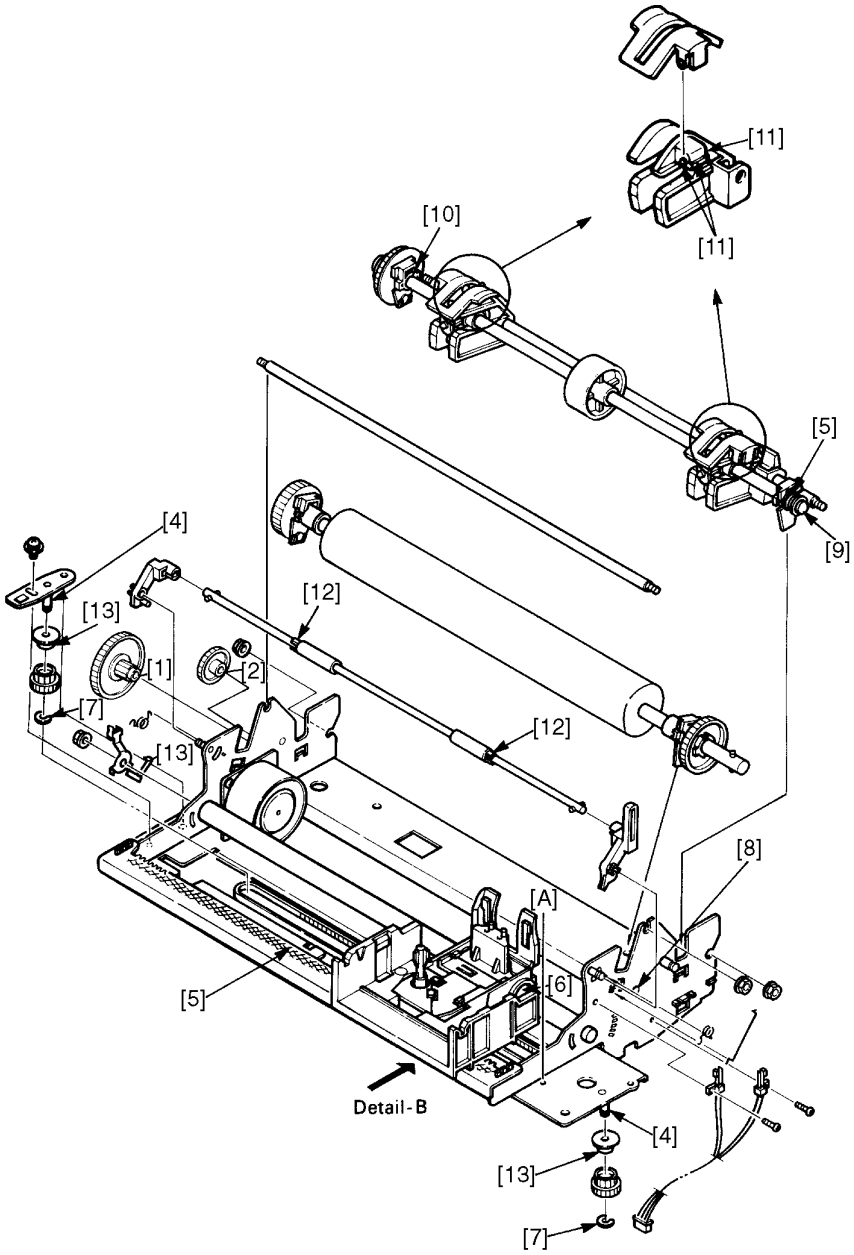


Fig. 5-1 Lubricated Areas

CHAPTER 6
TROUBLESHOOTING

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3. Repair by Unit Replacement 55

4. Repair by Replacement of Parts 61

   4-1 Does not Operate at ALL with Power on 61

   4-2 Power Supply Unit Abnormal 62

   4-3 Defective Motor Operation 63

   4-4 Defective Print Head Operation 64

   4-5 Defective Interface Operation 65

1. Troubleshooting Procedures

Troubleshooting is never easy because various problems arise depending upon the particular location of the breakdown, but the following procedures should be adhered to in making repairs.

(1) At the first stage, conduct repairs through unit replacements.
The two display codes appearing in the flow chart are defined as follows: 1) indicates main logic board replacement and 2) indicates printer mechanism replacement, to be carried out if the problem has not been corrected.

1)	Main Logic Board Replacement
2)	Printer Mechanism Replacement

Check again at this time whether the replaced unit is malfunctioning. (This is done to rule out trouble caused by improper contact of connectors.)

Replaceable units consist of the following:

- Power supply unit
- Main logic board
- Printer mechanism

In replacing these units, always refer to the unit replacement flow chart.

(2) At the second stage, use the flow chart for repair by parts replacement to replace defective elements inside a particular unit.

(Note 1) Before starting to repair, be sure to check visually the contact of the connector and the mounting of the IC in the IC socket.

(Note 2) Always turn off power source and remove power plug before replacing any units or parts.

(Note 3) If any check items appear on the flow chart, be sure to always check them. Otherwise, newly mounted parts or units may become damaged.

(Note 4) If, in the process of making repairs, there is any confusion about proper procedures, start to do the job again from the beginning.

(Note 5) Refer to the oscilloscope waveforms presented in Chapter 7 when repairing boards.

(Note 6) Be careful to avoid injury from static electricity when handling ICs and main logic boards.

(3) The following relate to the "*" marks in the flow chart.

*1 See (6) and (7) waveform in Item 7 of Chapter 7 or Chapter 8 and Fig. 2-10 ~ 17 in Chapter 2.

*2 See (8) and (9) waveform in Item 7 of Chapter 7 or Chapter 8.

*3 See (4) and (5) waveform in Item 7 of Chapter 7 or Chapter 8.

*4 See 3. Power Supply unit in Chapter 2.

*5 See 2-1. Data Input Operation in Chapter 2 and (10) or (11) waveform in Item 7 of Chapter 7 or Chapter 8.

*6 See (2) $\overline{\text{RESET}}$ waveform in Item 7 of Chapter 7 or Chapter 8.

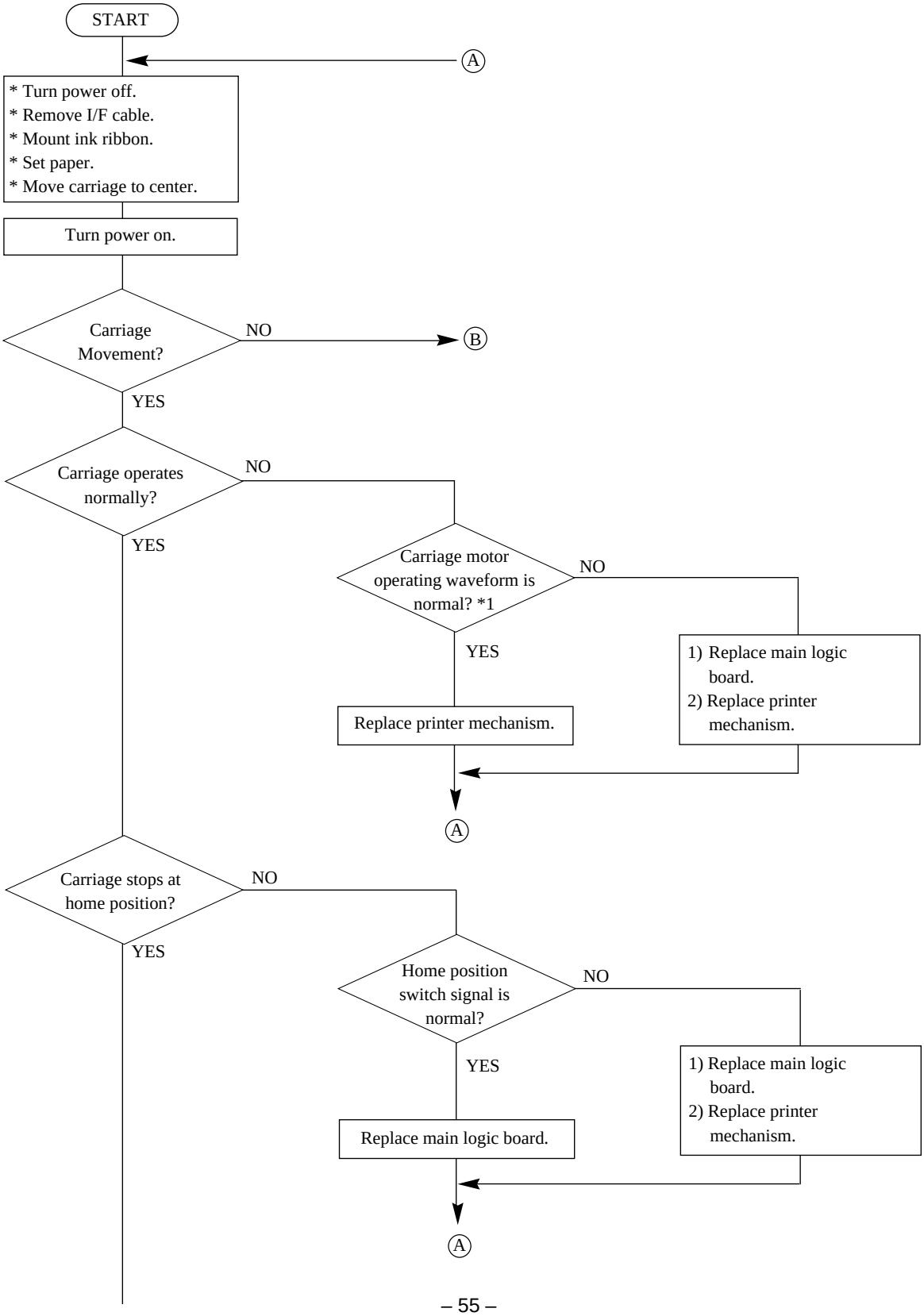
*7 See (1) Crystal waveform in Item 7 of Chapter 7 or Chapter 8.

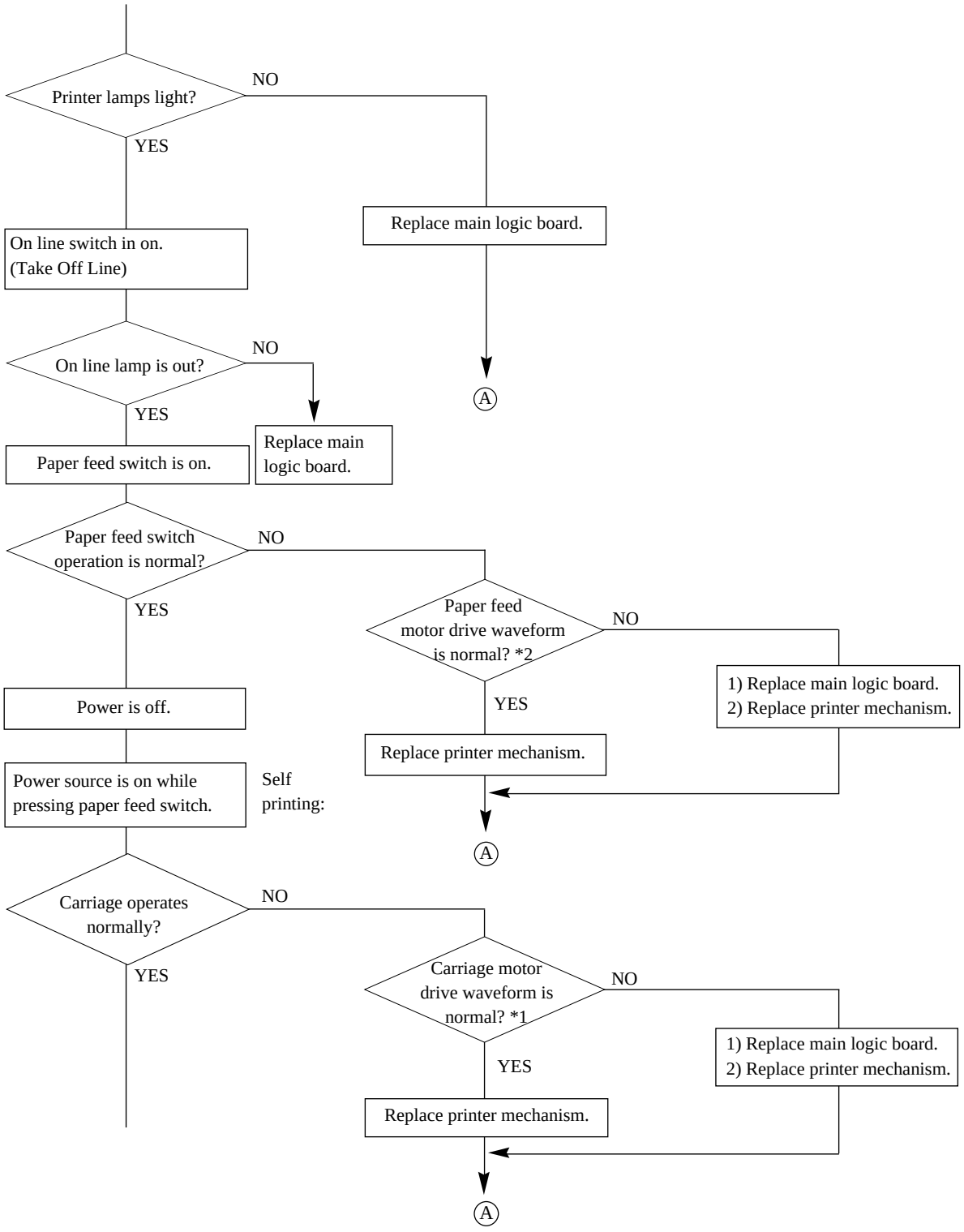
2. Unit Replacement Flow Chart

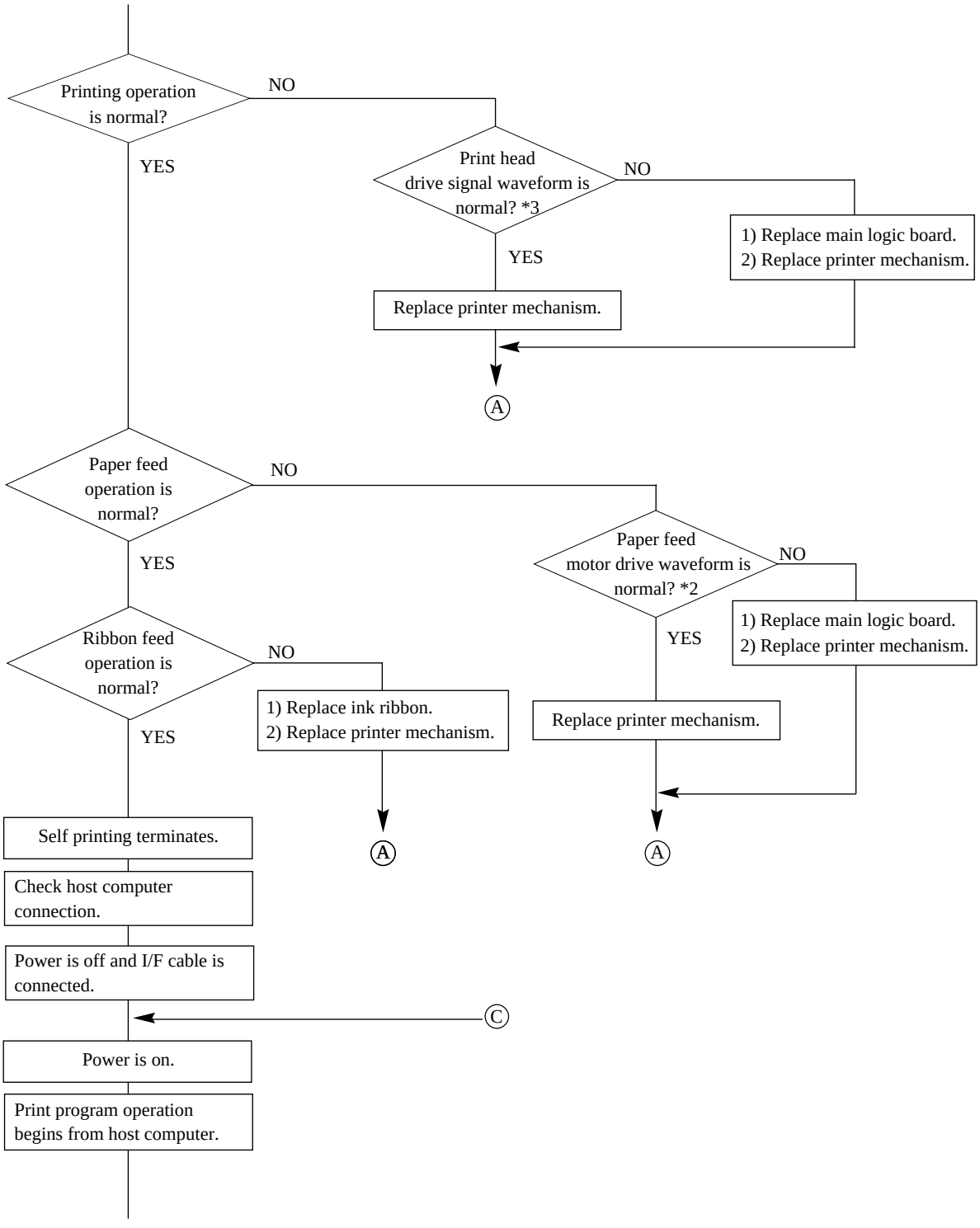
Category	Problem Details	Unit Exchange Sequence			Remarks
		Power supply unit	Main logic board	Printer mechanism	
Operation related	Specific display lamp only will not glow		1		
	Specific switch only cannot be input		1		
	Buzzer does not sound (sound volume inadequate)		1		
Motor related	Strange sounds during operation		1	2	
	No motor holding power (power very weak)	2	1		
Print head related	Dots skipped		2	1	
	Print is too light		2	1	Ink ribbon
	Ink ribbon entanglement (wire sticks out)		2	1	Gap check
Detector related	Absence of paper not detected		2	1	Check setting of DIP switch
	Lever position not detected		1	2	
Interface related and others	Incorrect printing		1		Check I/F cable
	Ink ribbon not forwarded			1	
	No operation at DIP switch setting		1		
	Faulty operation when power is turned on/off		1		
	Abnormal motor operating speed (slow)		1	2	
	Fuse blown during operation	3	1	2	

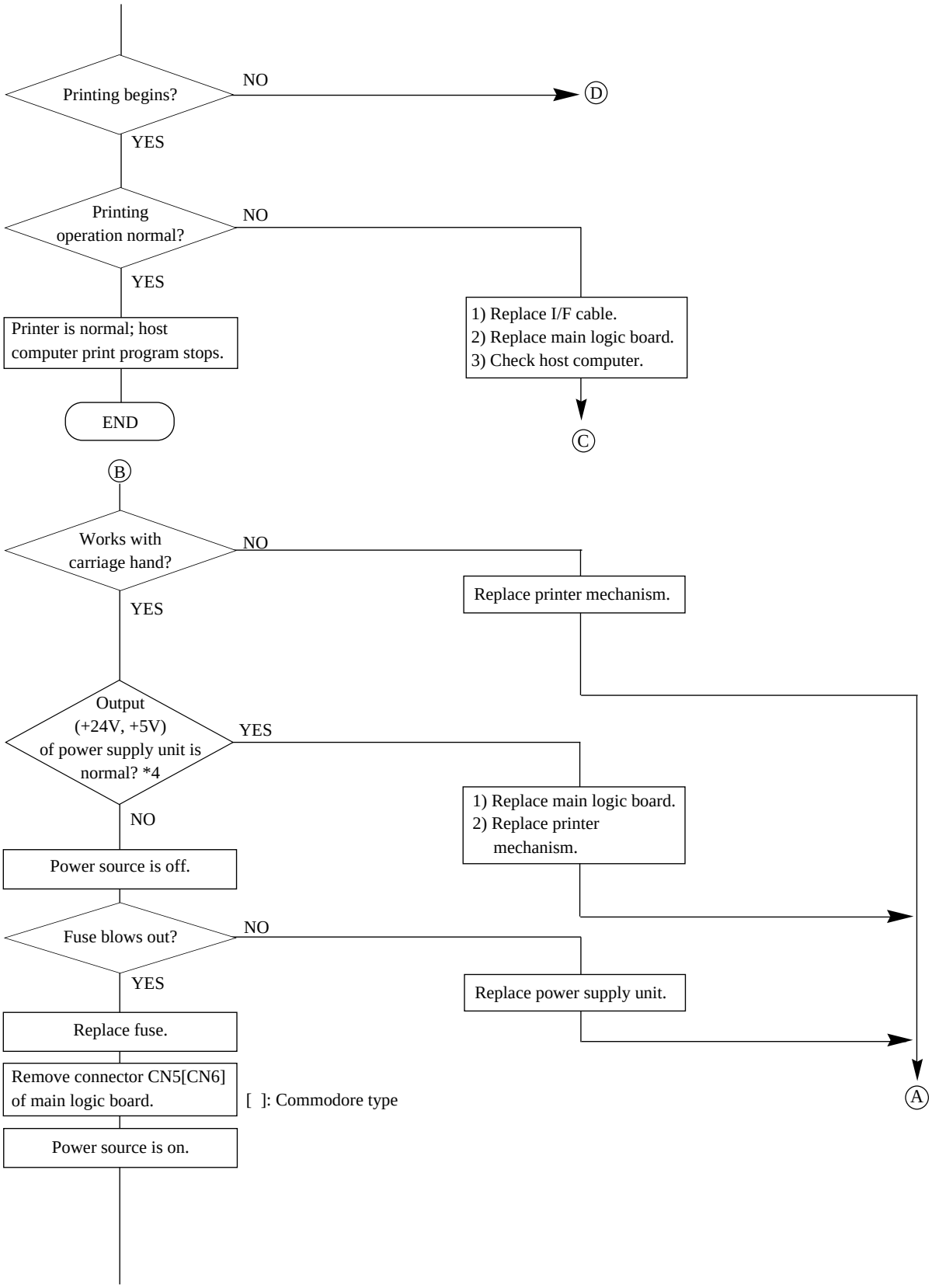
Note: The figures 1, 2 and 3 mean the priority of replacement.

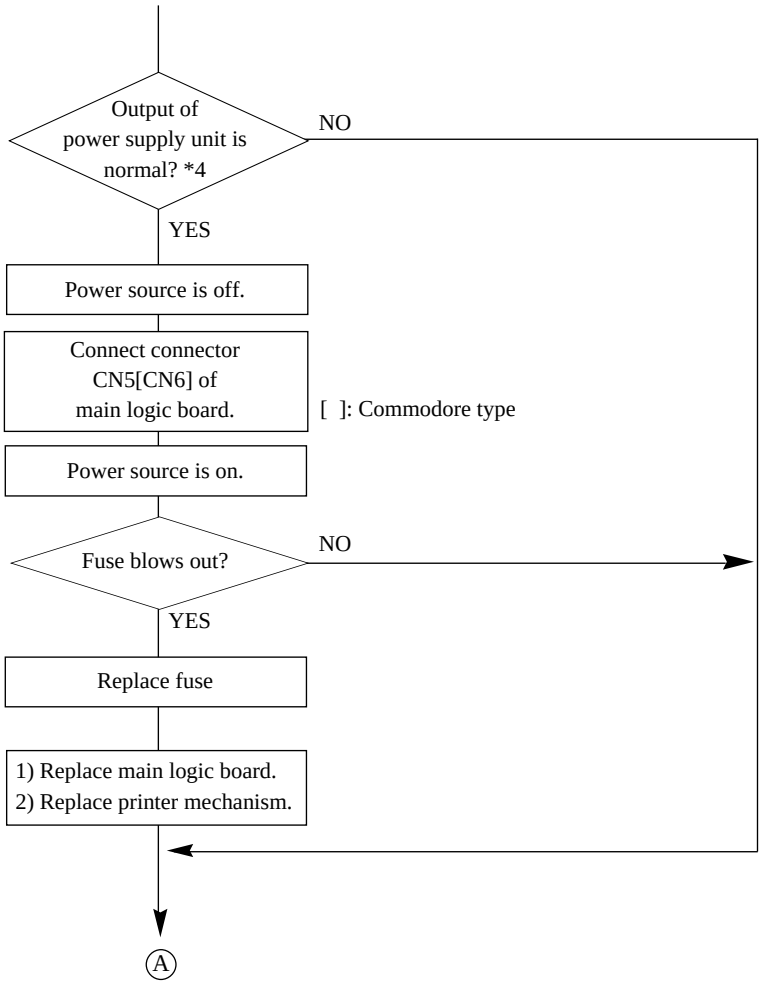
3. Repair by Unit Replacement

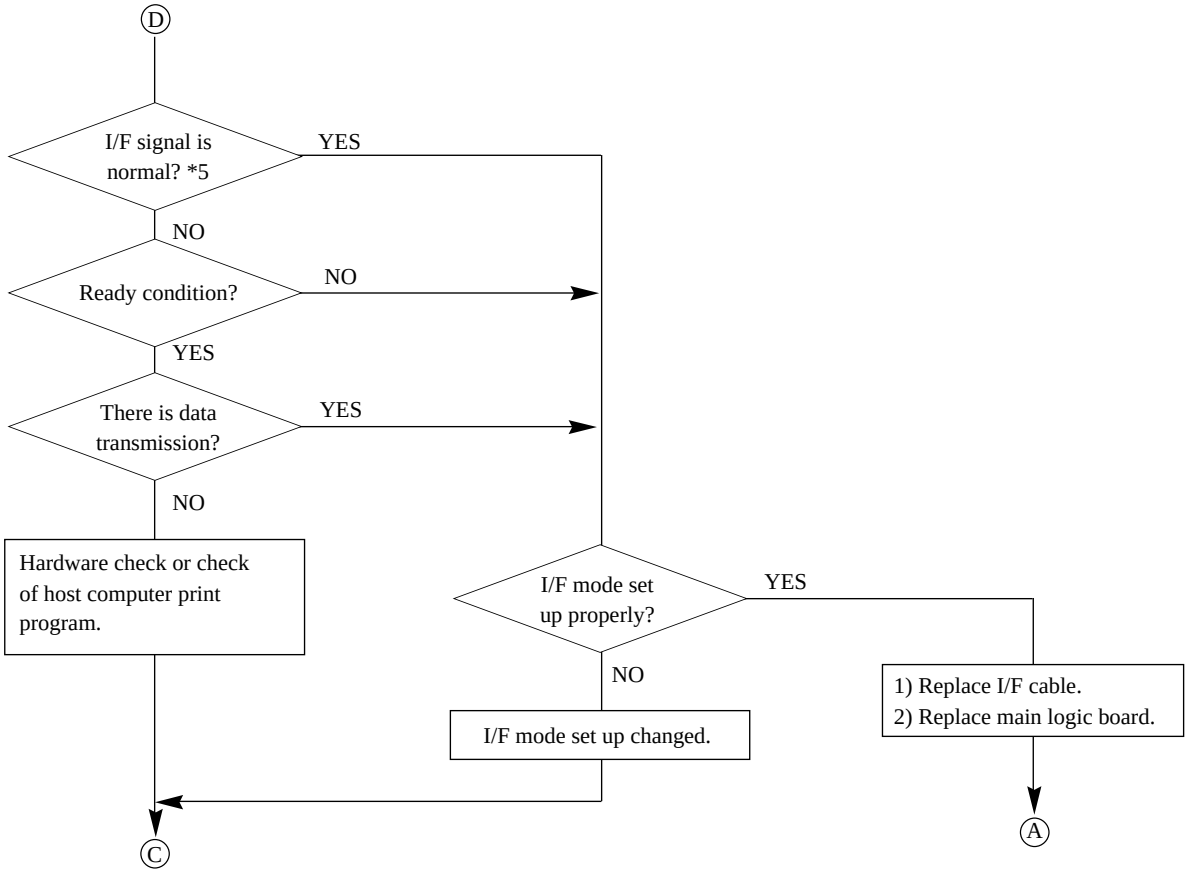



Printer lamps light?
NO
YES
Replace main logic board.
On line switch in on.
(Take Off Line)
On line lamp is out?
NO
YES
A
Replace main
logic board.
Paper feed switch is on.
Paper feed switch
operation is normal?
NO
YES
Paper feed
motor drive waveform
is normal? *2
NO
YES
1) Replace main logic board.
2) Replace printer mechanism.
Power is off.
Replace printer mechanism.
Power source is on while
pressing paper feed switch.
Self
printing:
A
Carriage operates
normally?
NO
YES
Carriage motor
drive waveform is
normal? *1
NO
YES
1) Replace main logic board.
2) Replace printer mechanism.
Replace printer mechanism.
A


Printing operation is normal?
NO
YES
Print head drive signal waveform is normal? *3
NO
YES
1) Replace main logic board.
2) Replace printer mechanism.
Replace printer mechanism.
A
Paper feed operation is normal?
NO
YES
Paper feed motor drive waveform is normal? *2
NO
YES
1) Replace main logic board.
2) Replace printer mechanism.
Replace printer mechanism.
A
Ribbon feed operation is normal?
NO
YES
1) Replace ink ribbon.
2) Replace printer mechanism.
A
Self printing terminates.
Check host computer connection.
Power is off and I/F cable is connected.
C
Power is on.
Print program operation begins from host computer.

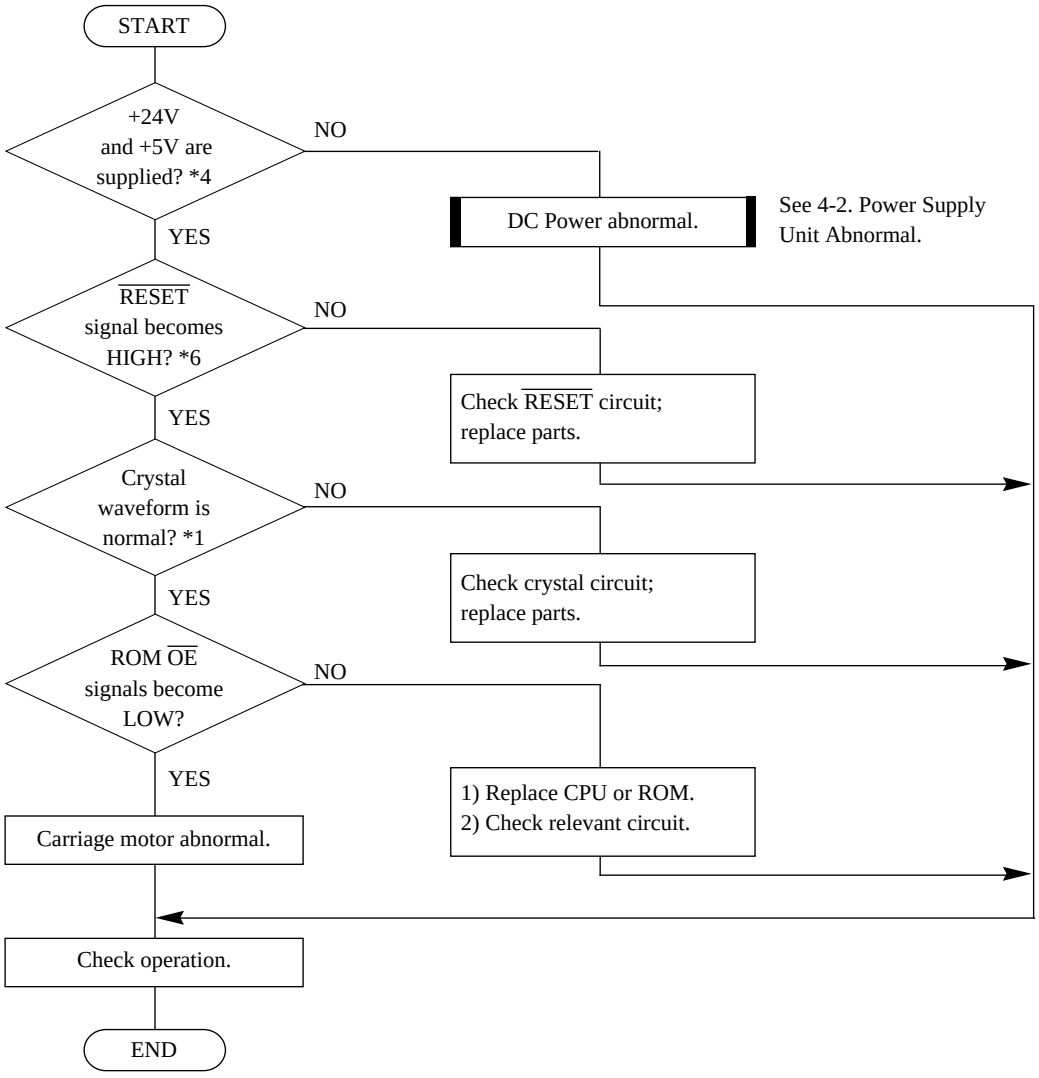

Printing begins?
NO
D
YES
Printing operation normal?
NO
YES
Printer is normal; host computer print program stops.
END
1) Replace I/F cable.
2) Replace main logic board.
3) Check host computer.
C
B
Works with carriage hand?
NO
YES
Replace printer mechanism.
Output (+24V, +5V) of power supply unit is normal? *4
YES
NO
1) Replace main logic board.
2) Replace printer mechanism.
Power source is off.
Fuse blows out?
NO
YES
Replace power supply unit.
Replace fuse.
Remove connector CN5[CN6] of main logic board.
[ ]: Commodore type
Power source is on.
A


Output of
power supply unit is
normal? *4
NO
YES
Power source is off.
Connect connector
CN5[CN6] of
main logic board.
[ ]: Commodore type
Power source is on.
Fuse blows out?
NO
YES
Replace fuse
1) Replace main logic board.
2) Replace printer mechanism.
A


D
I/F signal is normal? *5
YES
NO
Ready condition?
NO
YES
There is data transmission?
YES
NO
Hardware check or check of host computer print program.
I/F mode set up properly?
YES
NO
I/F mode set up changed.
1) Replace I/F cable.
2) Replace main logic board.
A
C

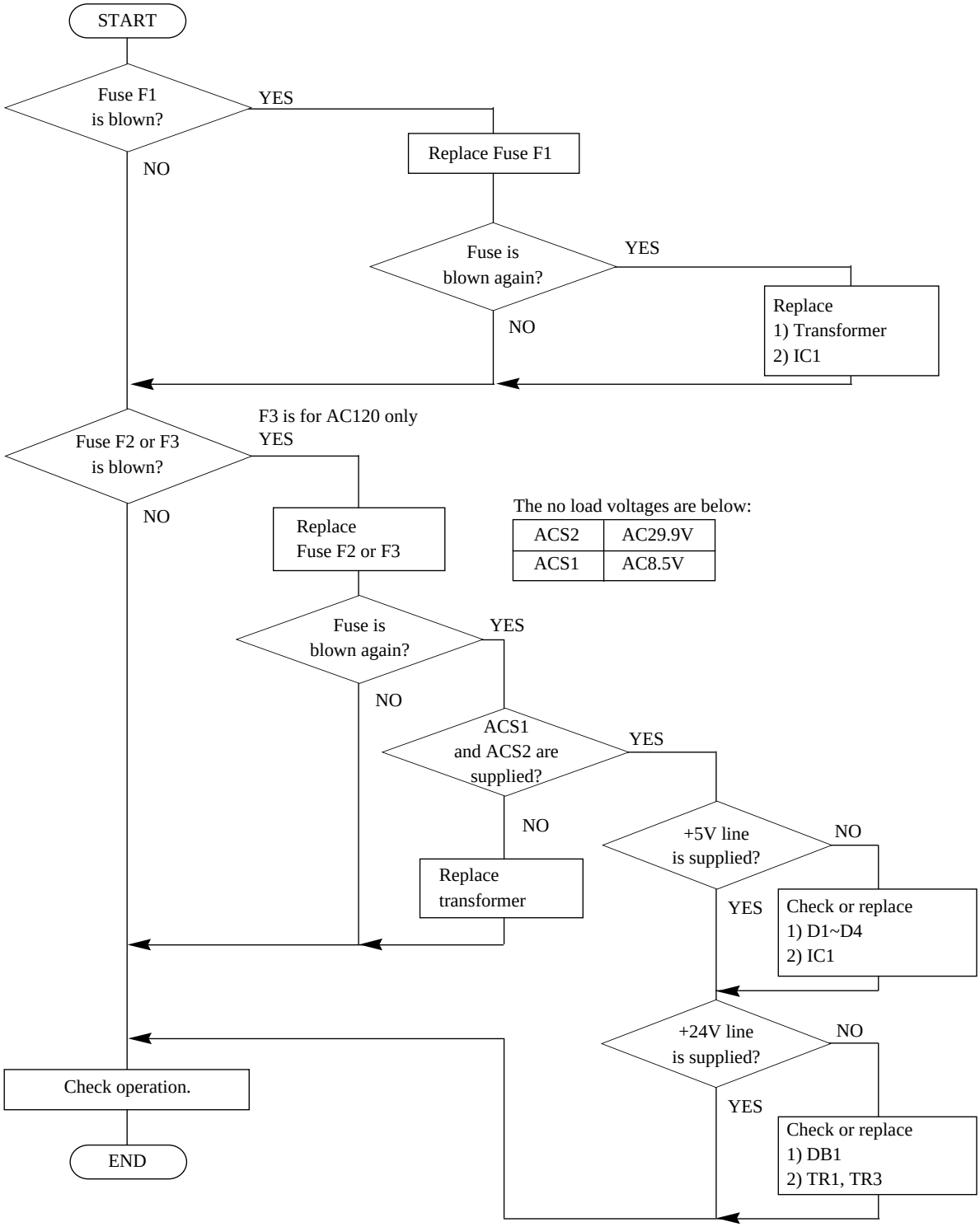
4. Repair by Replacement of Parts

4-1. Does not Operate at All with Power on

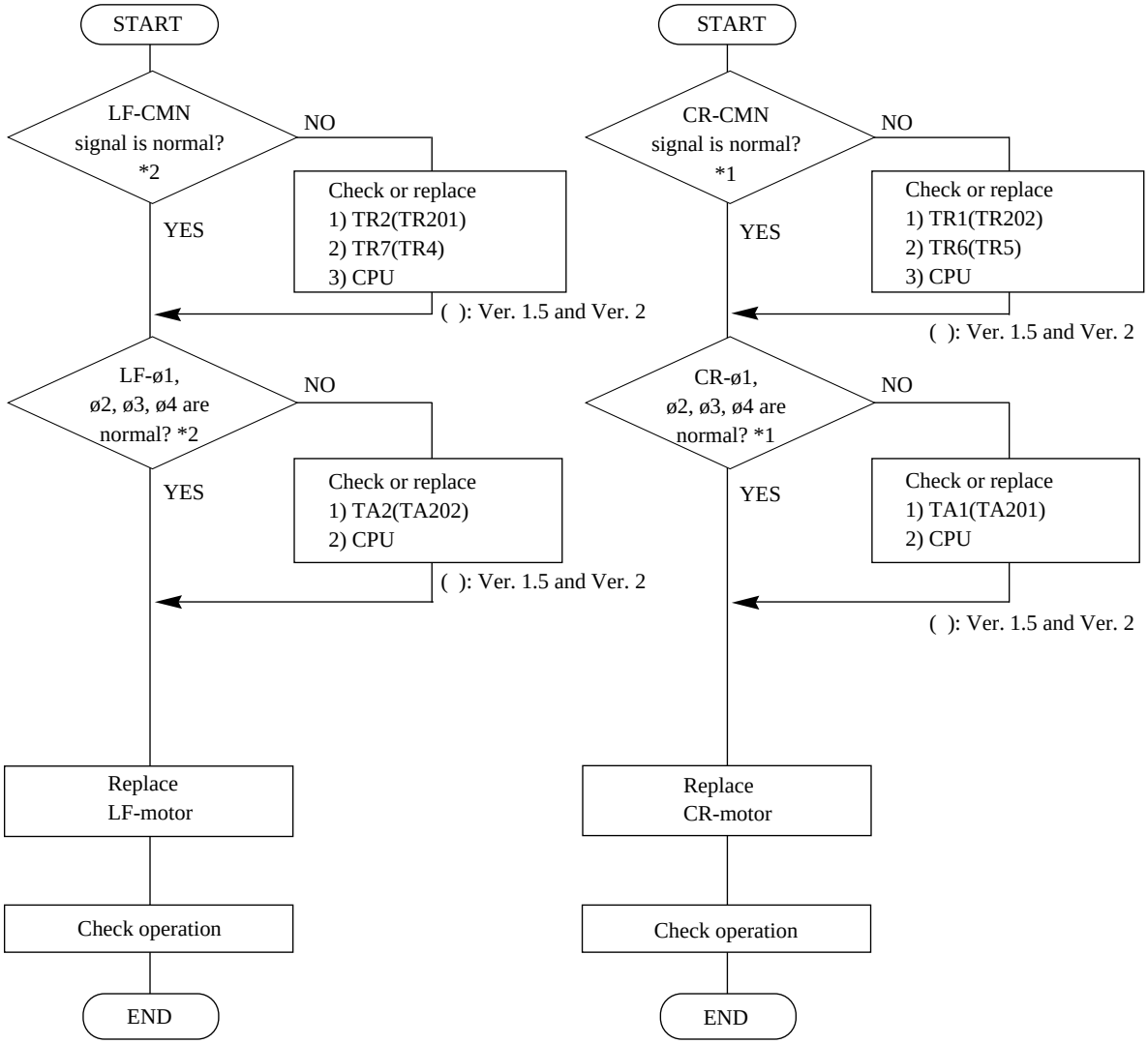


4-2. Power Supply Circuit Abnormal

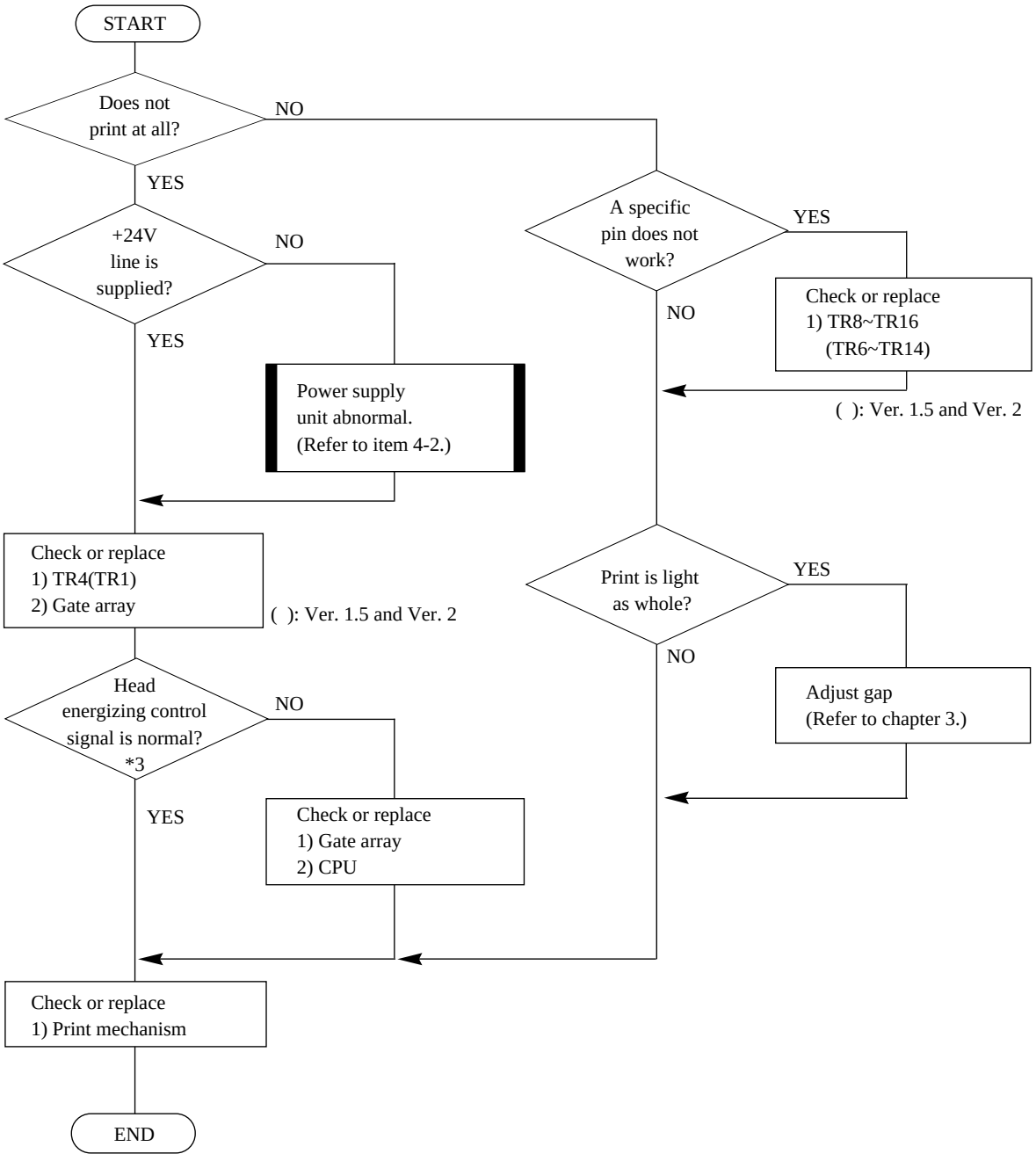
(1) Remove connector CN5 (CN6 for Commodore type) of the main logic board.



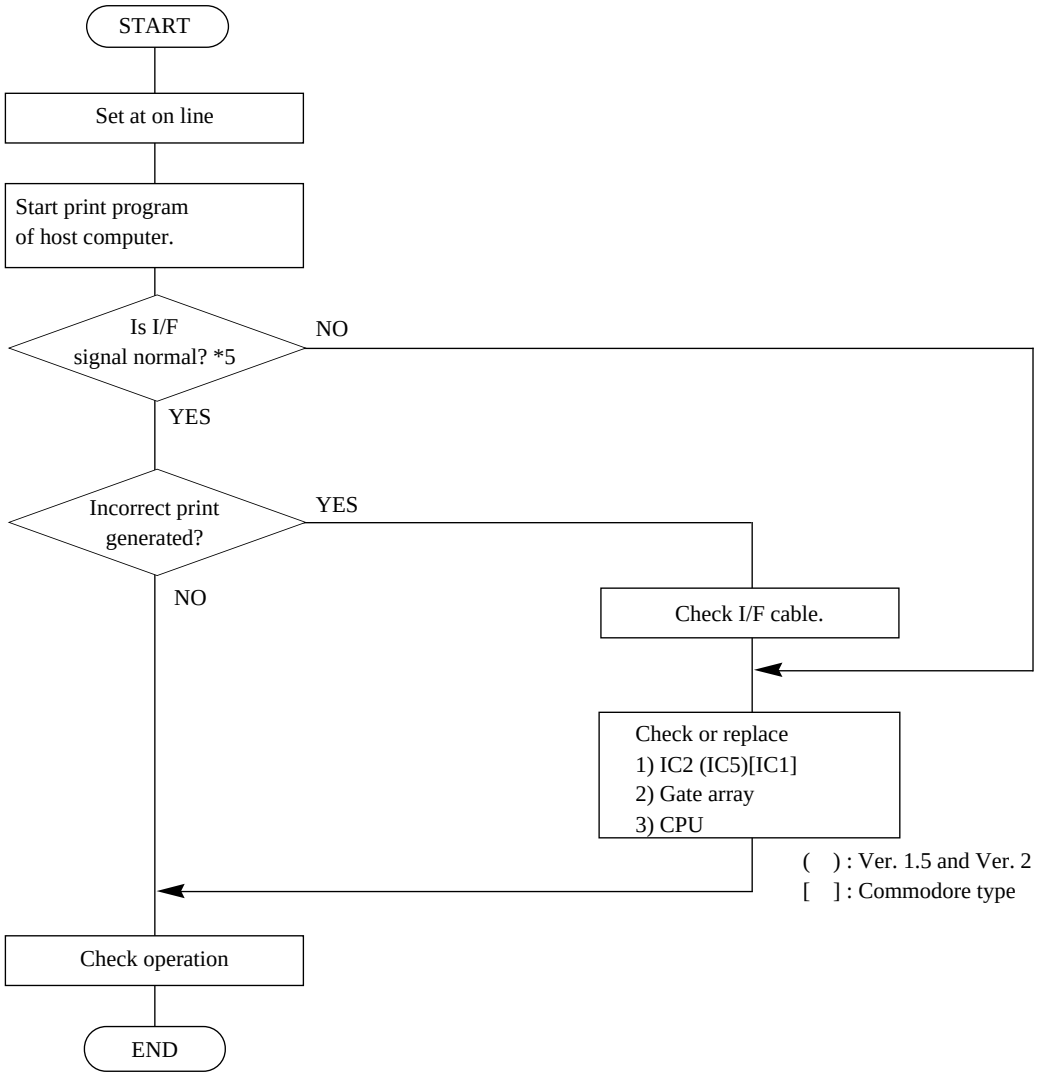
4-3. Defective Motor Operation



4-4. Defective Print Head Operation



4-5. Defective Interface Operation



CHAPTER 7
PARTS LIST (For Ver. 1 and Ver. 1.5)

HOW TO USE PARTS LIST

(1) DRWG. NO.
This column shows the drawing number of the illustration.

(2) REVISED EDITION MARK
This column shows a revision number.
Part that have been added in the revised edition are indicated with "#".
Part that have been abolished in the revised edition are indicated with "*". For example,
#1 :First edition→Second edition *1 :First edition→Second edition

(3) PARTS NO.
Parts numbers must be indicated when ordering replacement parts.

(4) PARTS NAME
Parts names must be indicated when ordering replacement parts.

(5) Q'TY
This column shows the number of the part used as indicated in the figure.

(6) REMARKS
When there are differences in the specifications of the fuse, destinations, etc., the differences are described in words or indicated by two letters.

US .....U.S.A.	EC ..... EC (220V)	AS .....Australia
MAS .....Mass Merchant (NX MALTI TYPE)	WG ..... Germany	NBR .....No Brand
	SC..... Scandinavia	SU .....Russia
TW .....Taiwan	HK..... Hong Kong	MONO .....Monochrome
UE .....EC (120V)	UK..... United Kingdom	CL .....Color Type

The seal number of ROM is described in this column. The "**" mark of a seal number is variable depending on the software version.

(7) RANK
Parts marked "S" are service parts. Service parts are recommendable for maintenance.

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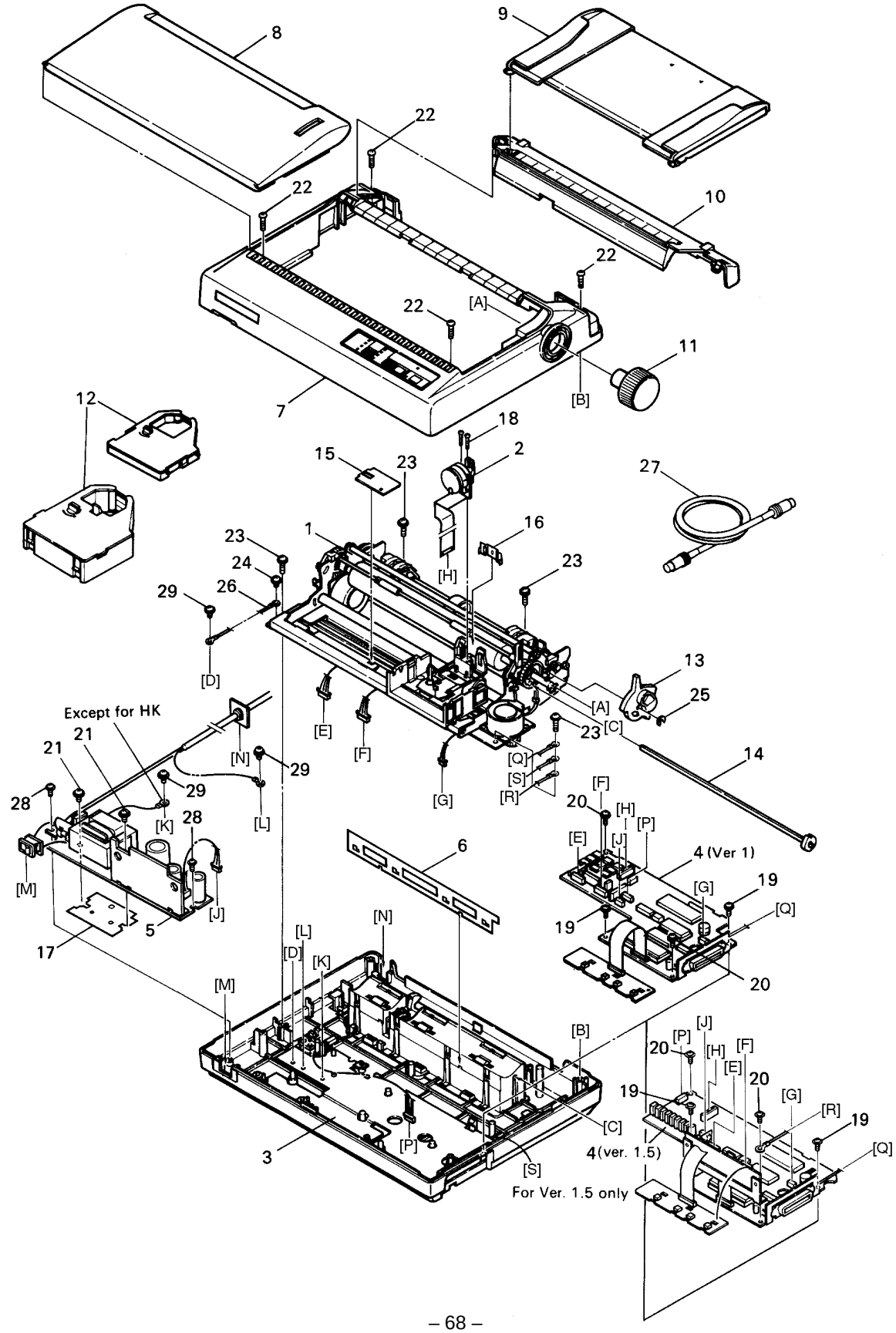
1. Printer Assembly (Ver. 1 and 1.5)

1-1. Disassembly Drawing



1-2. Parts List Printer Assembly (Ver .1 and 1.5)

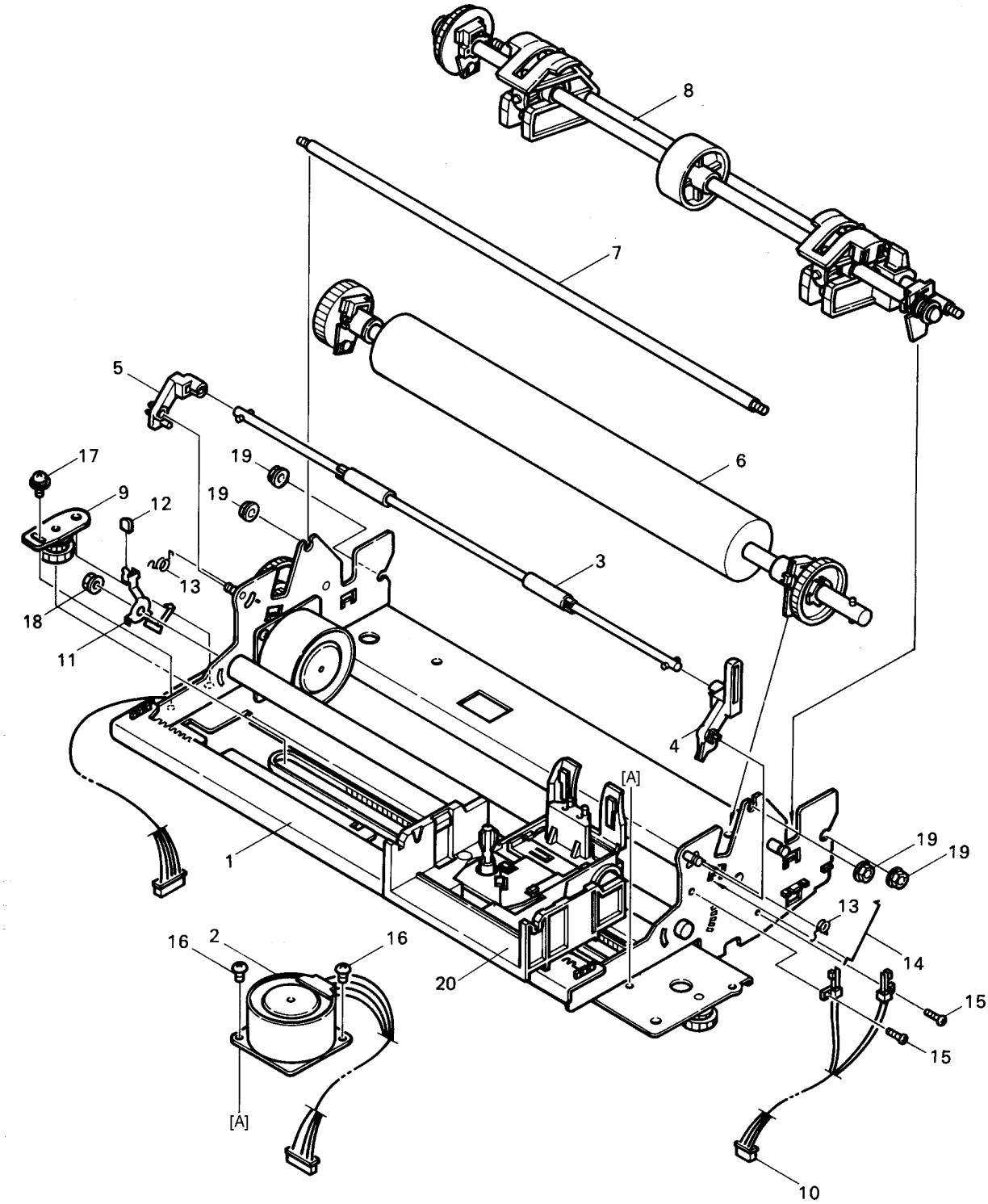
Printer Assembly (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		89060010	PRINTER MECHANISM DP891	1	FOR MONO(VER.1.0)	S
	#2	89060050	PRINTER MECHANISM DP891D	1	FOR MONO(VER.1.5)	S
	#1	89060020	PRINTER MECHANISM DP891CL	1	FOR CL(VER.1.0)	S
	#2	89060060	PRINTER MECHANISM DP891DCL	1	FOR CL(VER.1.5)	S
2		89130010	PRINT HEAD DP8901	1		S
3		87291010	LOWER CASE UNIT NX-1000	1	FOR VER.1.0	S
	#2	87291050	LOWER CASE UNIT NX-1000D	1	FOR VER.1.5	S
4		87292010	MAIN LOGIC BOARD UNIT NX-1000	1	MONO(1.1),PARALLEL	S
	#2	87292090	MAIN LOGIC BOARD UNIT NX-1000D	1	MONO(1.5),PA. EX. HK	S
	#3	87292110	MAIN LOGIC BD UNIT NX-1000D HK	1	MONO(1.5),PA. FOR HK	S
	#1	87292030	MAIN LOGIC BOARD UNIT NX1000CL	1	CL(1.0),PARALLEL	S
	#2	87292100	MAIN LOGIC BD UNIT NX-1000DCL	1	CL(1.5),PA. EX. HK	S
	#3	87292140	MAIN LOGIC BD UNIT NX1000DCLHK	1	CL(1.5),PA. FOR HK	S
		87292020	MAIN LOGIC BOARD UNIT NX-1000C	1	FOR MONO,COMMODORE	S
	#1	87292040	MAIN LOGIC BD UNIT NX-1000C CL	1	FOR CL,COMMODORE	S
5		87293060	POWER SUPPLY UNIT NX-1000 US	1	FOR US,UE,TW,MAS	S
		87293070	POWER SUPPLY UNIT NX-1000 EC	1	FOR EC,WG,NBR,SU	S
		87293100	POWER SUPPLY UNIT NX-1000 HK	1	FOR HK	S
	#2	87293180	POWER SUPPLY UNIT NX-1000 SC	1	FOR SC	S
		87293080	POWER SUPPLY UNIT NX-1000 UK	1	FOR UK	S
		87293090	POWER SUPPLY UNIT NX-1000 AS	1	FOR AS	S
6		82040070	SUB-GUIDE 891	1		S
7	#2	87290160	UPPER CASE UNIT NX-1000 MAS	1	FOR MAS :NX-1000	S
		87290010	UPPER CASE UNIT NX-1000	1	EXCEPT MAS :NX-1000	S
		87290080	UPPER CASE UNIT LC-10NBR	1	FOR NBR :LC-10	S
		87290030	UPPER CASE UNIT LC-10	1	EXCEPT FOR NBR:LC-10	S
		87290020	UPPER CASE UNIT NX-1000C	1	:NX-1000C	S
		87290080	UPPER CASE UNIT LC-10NBR	1	FOR NBR :LC-10C	S
		87290040	UPPER CASE UNIT LC-10C	1	EXCEPT NBR :LC-10C	S
	#1	87290050	UPPER CASE UNIT NX-1000CL US	1	FOR US :NX-1000CL	S
	#2	87290170	UPPER CASE UNIT NX-1000CL MAS	1	FOR MAS :NX-1000CL	S
	#1	87290070	UPPER CASE UNIT NX-1000 CL	1	TW,HK,AS :NX-1000CL	S
	#4	87290390	UPPER CASE UNIT NX-1000CL SU	1	FOR SU :NX-1000CL	S
	#1	87290120	UPPER CASE UNIT LC-10CL NBR	1	FOR NBR :LC-10CL	S
	#1	87290060	UPPER CASE UNIT LC-10CL	1	EXCEPT NBR :LC-10CL	S
	#1	87290090	UPPER CASE UNIT NX-1000C CL US	1	FOR US :NX-1000CCL	S
	#1	87290100	UPPER CASE UNIT NX-1000C CL	1	FOR HK,AS:NX-1000CCL	S
	#1	87290110	UPPER CASE UNIT LC-10C CL	1	:LC-10CCL	S
8		83022890	PRINTER COVER NX-1000	1		S
9	*2	87296010	PAPER GUIDE UNIT NX-1000	1		S
	*6	87296011	PAPER GUIDE UNIT NX-1000	1		S
	#6	87806010	PAPER GUIDE UNIT ZL-10	1		S
10	*6	83022900	REAR COVER NX-1000	1		S
	#6	83022901	REAR COVER NX-1000	1		S
11	*6	83120460	PLATEN KNOB NX-1000	1		S
	#6	83903910	PLATEN KNOB QA-10	1		S
12	*3	80980730	INK RIBBON CARTRIDGE WHT LC9	1	EXCEPT FOR NBR :MONO	S
	*7	80981160	INK RIBBON CARTRIDGE JA NX1000	1	EXCEPT US,NBR :MONO	S
	#7	80982290	INK RIBBON CARTRIDGE JAN LC9	1	EXCEPT US,NBR :MONO	S
	#3	80980850	INK RIBBON CARTRIDGE UPC LC9	1	FOR US :MONO	S
	*7	80980800	INK RIBBON CARTRIDGE NX1000NBR	1	FOR NBR :MONO	S
	#7	80980730	INK RIBBON CARTRIDGE WHT LC9	1	FOR NBR :MONO	S
	*3	80980740	INK RIBBON CARTRIDGE NX-1000CL	1	EXCEPT FOR NBR :CL	S
	*7	80981170	INK RIBBON CARTRIDGE JAN NX-CL	1	EXCEPT US,NBR,AS :CL	S
	#7	80982340	INK RIBBON CARTRIDGE JAN LC9CL	1	EXCEPT US,NBR,AS :CL	S
	*7	80981360	INK RIBBON CARTRIDGE UPC NX-CL	1	FOR US :CL	S

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
12	#7	80982330	INK RIBBON CARTRIDGE UPC LC9CL	1	FOR US :CL	S
	*7	80980810	INK RIBBON CARTRIDGE NX1000CLN	1	FOR NBR :CL	S
	#7	80982360	INK RIBBON CARTRIDGE WHT LC9CL	1	FOR NBR :CL	S
	#5	80982340	INK RIBBON CARTRIDGE JAN LC9CL	1	FOR AS :CL	S
13		83400450	RELEASE LEVER 891	1		S
14		87295020	RELEASE SHAFT UNIT NX-1000	1		S
15	*4	83910840	CABLE HOLDER 891	1		S
	#4	83910841	CABLE HOLDER 941	1		S
16	*1	82900770	RIBBON HOLDER 891	1	FOR MONO	S
	*2	82900771	RIBBON HOLDER 891	1	FOR MONO	S
	*4	82900772	RIBBON HOLDER 891	1	FOR MONO	S
	#4	82900773	RIBBON HOLDER 891	1	FOR MONO	S
	#1	82901010	RIBBON HOLDER 891CL	1	FOR CL	S
17		80991760	INSULATION SHEET NX-1000	1		S
18		01902612	SCREW TAT 2.6-16 PT	2		S
19		01903060	SCREW TAT 3-8 PT-FL	2		S
20	*1	01903055	SCREW TR 3-8 WS/WF	2		S
	*2	01903045	SCREW TR 3-8 FL	2		S
	#2	01903070	SCREW TR 3-8 WF	2		S
21	#2	01704103	SCREW TRHT 4-10-C	1	FOR US,MAS	S
		01914007	SCREW TR 4-8 WB	2	EXCEPT FOR US,MAS	S
22		01914030	SCREW TAT 4-15 PT	4		S
23		01914031	SCREW TAT 4-12 PT-FL	4		S
24	*1	01914029	SCREW TAT 4-8 CT-WB	4		S
	*4	01914032	SCREW TAT 4-7 CT	4		S
	*5	01914039	SCREW TAT 4-8 WS	1		S
	#5	01914034	SCREW TAT 4-8 CT-WF	1		S
25		04020016	STOP RING SE4.0	1		S
26	*2	80924910	WIRE 18UL1007G/Y100T	1		S
	#2	80924911	WIRE 18UL1007BLK100TT	1		S
27		80924440	INTERFACE CABLE COMMODORE	1	FOR COMMODORE ONLY	S
28	#2	01903071	SCREW TATH 3-10C1P	1	FOR US,MAS	S
	#2	01903060	SCREW TAT 3-8 PT-FL	1	EXCEPT FOR US,MAS	S
29	#4	01914036	SCREW TR 4-5 WS	2	FOR HK	S
	#4	01914014	SCREW TR 4-5 WB	3	FOR US,MAS	S
	#4	01914036	SCREW TR 4-5 WS	3	EXCEPT FOR HK,US,MAS	S
-	#2	89590090	ASF SF-10DJ UK	1	FOR UK,EC,SC,TW :OP.	
	#3	89590093	ASF SF-10DJ US	1	FOR US,MAS :OPTION	
	#2	89590091	ASF SF-10DJ WG	1	FOR WG :OPTION	
	#5	89590095	ASF SF-10DJ AS	1	FOR AS :OPTION	
	#4	89590096	ASF SF-10DJ HK	1	FOR HK,SU :OPTION	

2. Printer Mechanism (Ver. 1 and 1.5)

2-1. Disassembly Drawing



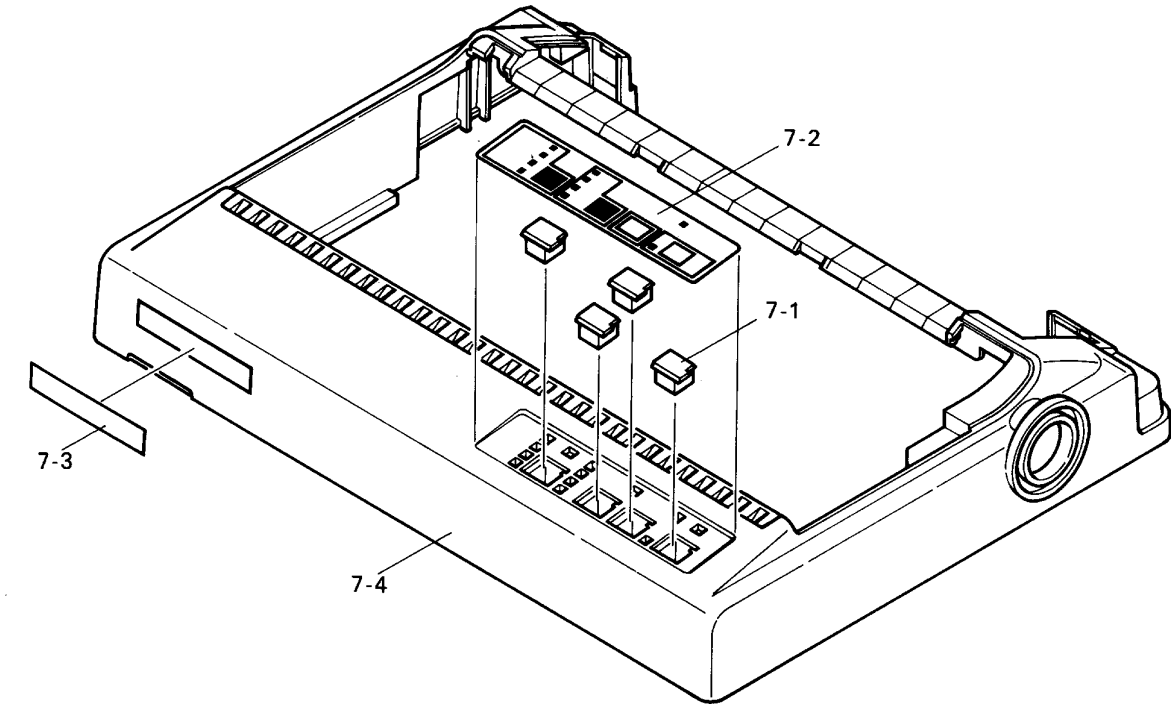
2-2. Parts List

Printer Mechanism (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1		87060010	FRAME UNIT	891	1	FOR MONO(VER.1.0)	
	#2	87060050	FRAME UNIT	891D	1	FOR MONO(VER.1.5)	
	#1	87060020	FRAME UNIT	891CL	1	FOR CL(VER.1.0)	
	#2	87060070	FRAME UNIT	891DCL	1	FOR CL(VER.1.5)	
2		87061010	CARRIAGE MOTOR UNIT	891	1	FOR MONO(VER.1.0)	S
	#2	87061060	CARRIAGE MOTOR UNIT	891D	1	FOR MONO(VER.1.5)	S
	#1	87061030	CARRIAGE MOTOR UNIT	891CL	1	FOR CL(VER.1.0)	S
	#2	87061100	CARRIAGE MOTOR UNIT	891DCL	1	FOR CL(VER.1.5)	S
3		87067020	BAIL ROLLER SHAFT UNIT	891	1		
4		83400440	BAIL LEVER R	891	1		S
5		83400460	BAIL LEVER L	891	1		S
6		87063010	PLATEN UNIT	891	1		S
7	*1	81370520	TRACTOR STAY	891	1		
	*5	81370521	TRACTOR STAY	891	1		
	#5	81370522	TRACTOR STAY	891	1		
8		87066010	TRACTOR UNIT	891	1		S
9		87067010	TENSION LEVER UNIT	891	1		
10		87065010	DETECTOR UNIT	891	1		S
11		82400960	ADJUSTING LEVER	891	1		
12		04991229	VINYL CAP D2X5		1		
13		80530510	BAIL LEVER SPRING	891	2		S
14	*2	80530530	GROUND CONTACT SPRING	891	1		S
	*4	80530570	GROUND CONTACT SPRING	921	1		S
	#4	80530571	GROUND CONTACT SPRING	921	1		S
15	*2	00820404	SCREW TR 2-4		2	FOR TAPPED HOLE	S
	*4	00920503	SCREW TAT 2-5 CT		2	FOR NON-TAPPED HOLE	S
	#4	00926603	SCREW TAT 2.6-6 CT		2	FOR NON-TAPPED HOLE	S
16	*2	00630404	SCREW TR 3-4		2		S
	#2	01903064	SCREW TAT 3-5 CT		2		S
17		01903018	SCREW TR 3-6 WS/WF		1		S
18	#1	02040402	FLANGED NUT NHW4		1		S
19	*5	02040403	TOOTHED NUT NHK4		4		S
	#5	02020401	HEXAGON NUT NH4-2		4		S
20	#4	87060340	CARRIAGE ASSY	891	1	FOR MONO(VER.1.0)	
	#4	87060341	CARRIAGE ASSY	891B	1	FOR MONO(VER.1.5)	
	#4	87060350	CARRIAGE ASSY	891CL	1	FOR CL(VER.1.0)	
	#4	87060440	CARRIAGE ASSY	891DCL	1	FOR CL(VER.1.5)	
-		04991204	FASTENER T18S		2		S
	*2	04991228	MINI CORD CLAMP UAMS-05-2		4		S
	#2	04991230	MINI CORD CLAMP UAMS-05-SN		4		S

3. Sub-assembly (Ver. 1 and 1.5)

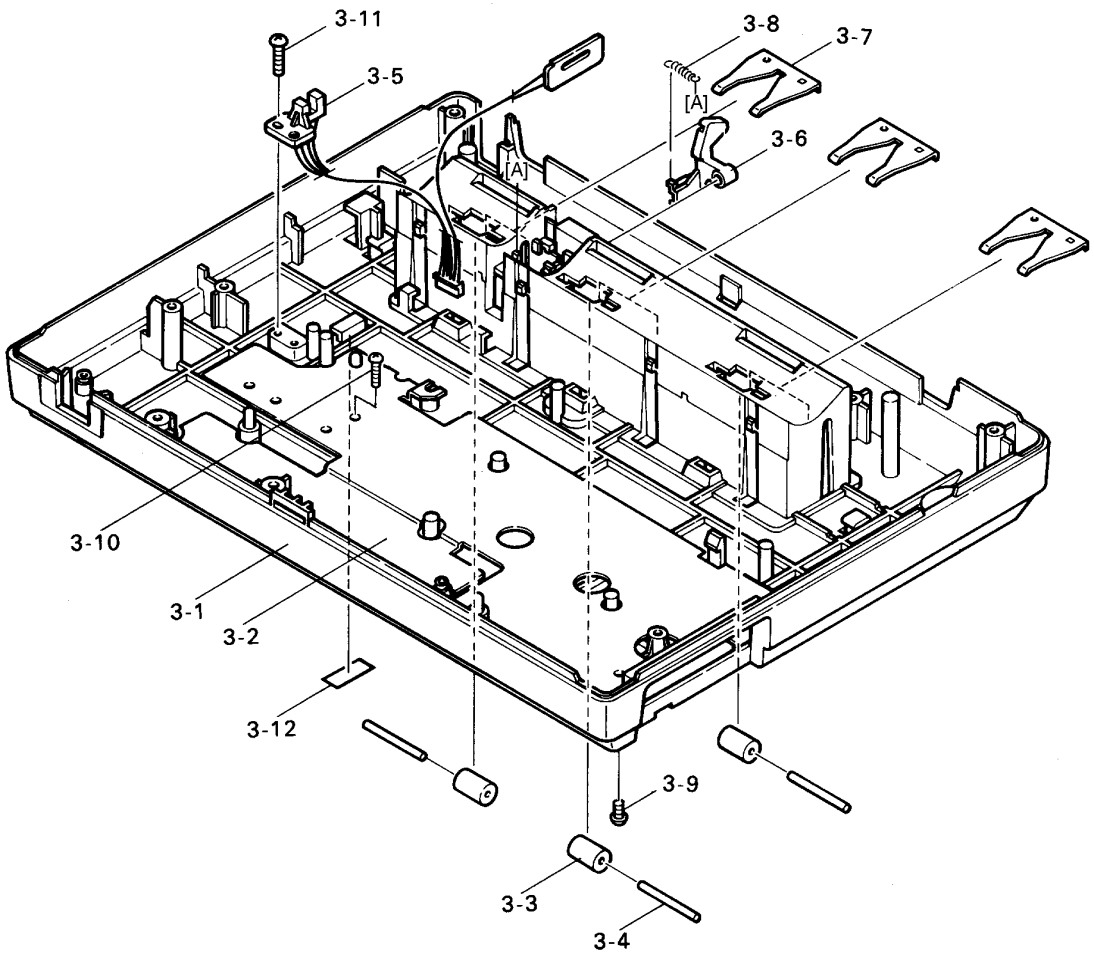
3-1. Upper Case Unit



Upper Case Unit (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
7-1		83901660	SWITCH ACTUATOR NX-1000	4		S
7-2		80085780	OPERATION SHEET NX-1000	1	FOR MONO	S
	#1	80085900	OPERATION SHEET NX-1000CL	1	FOR CL	S
	#4	80086020	OPERATION SHEET SPECIAL LC10CL	1	FOR SU	S
7-3	#2	80081870	BRAND PLATE NX MULTI-TYPE	1	FOR MAS :NX-1000	S
		80081210	BRAND SEAL NX-1000	1	EXCEPT MAS :NX-1000	S
		80081290	BRAND SEAL LC-10	1	:LC-10	S
		80081220	BRAND SEAL NX-1000C	1	:NX-1000C	S
		80081300	BRAND SEAL LC-10C	1	:LC-10C	S
	#1	80081270	BRAND PLATE NX-1000 RAINBOW	1	FOR US,SU :NX-1000CL	S
	#2	80081880	BRAND PLATE NX MULTI-COLOR	1	FOR MAS :NX-1000CL	S
	#1	80081310	BRAND PLATE NX-1000 COLOUR	1	TW,HK,AS :NX-1000CL	S
	*6	80081280	BRAND PLATE LC-10 CL	1	:LC-10CL	S
	#6	80081281	BRAND PLATE LC-10 CL	1	:LC-10CL	S
	#1	80081340	BRAND PLATE NX-1000C RAINBOW	1	FOR US :NX-1000CCL	S
	#1	80081350	BRAND PLATE NX-1000C COLOUR	1	FOR HK,AS:NX-1000CCL	S
	#1	80081360	BRAND PLATE LC-10C CL	1	:LC-10CCL	S
					NOT MOUNTED :FOR NBR	
7-4	*6	83022880	UPPER CASE NX-1000	1		
	#6	83022881	UPPER CASE NX-1000	1		

3-2. Lower Case Unit

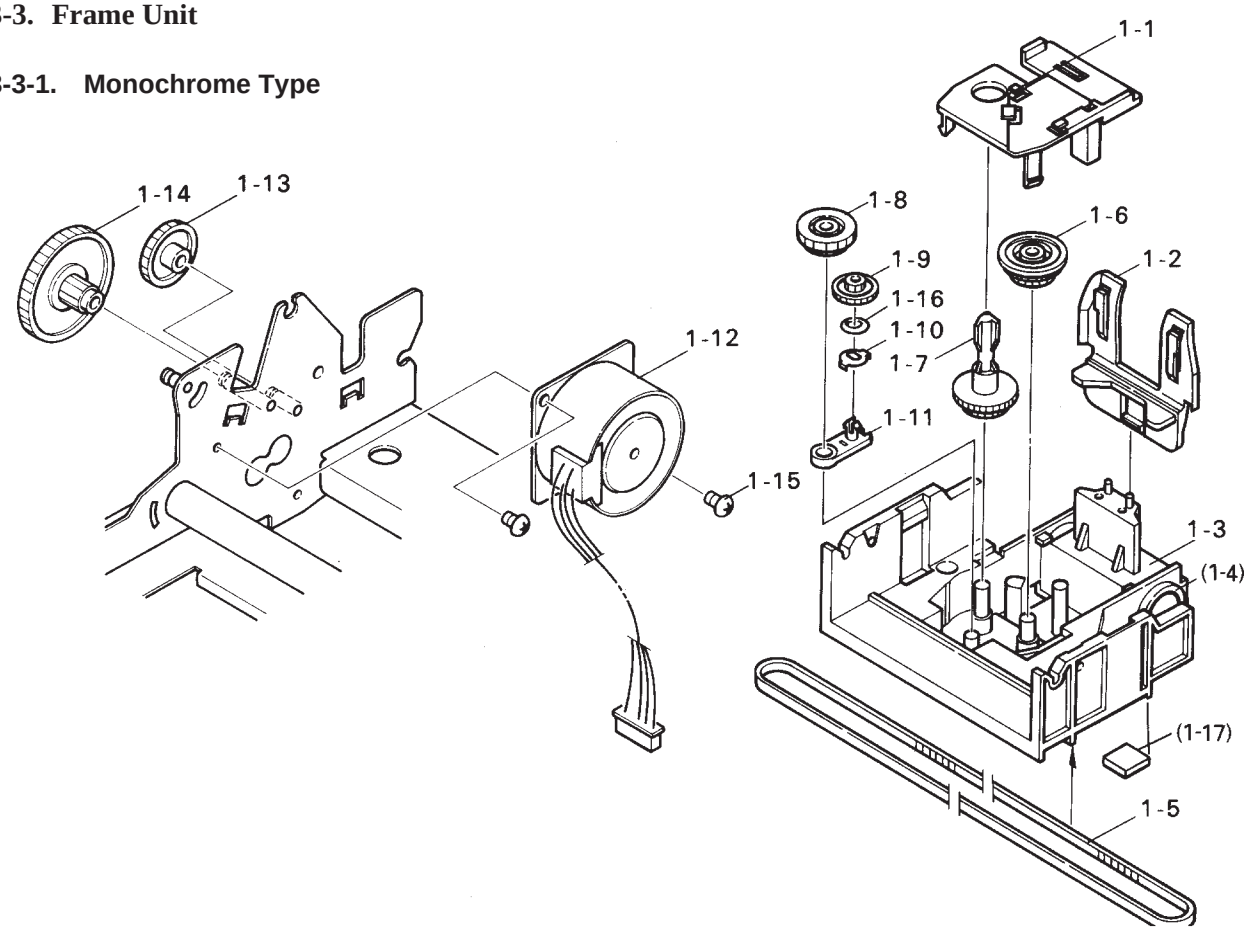


Lower Case Unit (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
3-1	*6	83022910	LOWER CASE NX-1000	1		
	#6	83022911	LOWER CASE NX-1000	1		
3-2	*3	82010760	LOWER CASE CHASSIS NX-1000	1		
	#3	82010761	LOWER CASE CHASSIS NX-1000	1		
3-3		83200640	HOLDER ROLLER 891	3		S
3-4		81301320	ROLLER SHAFT 891	3		S
3-5		87291320	DETECTOR UNIT NX-1000	1	FOR VER.1.0	S
	#2	87291330	DETECTOR UNIT A NX-1000D	1	FOR VER.1.5	S
3-6		87291310	PE DETECTOR LEVER ASSY NX-1000	1		
3-7		82500810	RELEASE SPRING 891	3		S
3-8		80510700	SPRING E030-014-0088	1		S
3-9	*5	01903064	SCREW TAT 3-5 CT	1		S
	#5	01903094	SCREW TAT 3-5 DT	1		S
3-10		00930803	SCREW TAT 3-8 PT	3		S
3-11		01903047	SCREW TAT 3-12 PT-FL	1		S
3-12		80991800	BLIND SHEET NX-1000	1		
-	#2	80700500	WIRE 18UL1007BLK080TS	1	FOR VER.1.5 ONLY	

3-3. Frame Unit

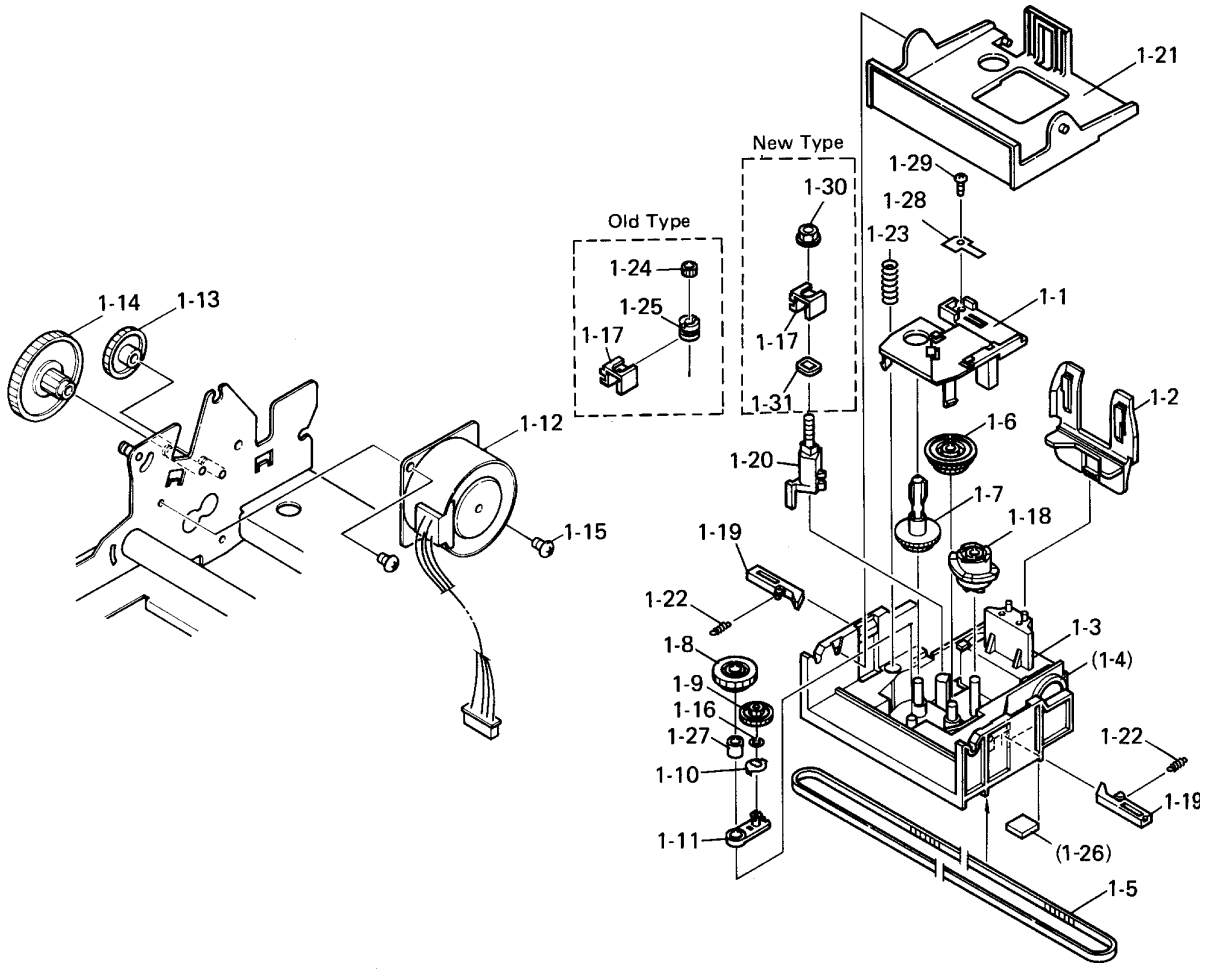
3-3-1. Monochrome Type



Frame Unit (Monochrome: Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1-1	*2	83910852	GEAR COVER 891	1		S
	#2	83910853	GEAR COVER 891	1		S
1-2	*2	83901611	CARD HOLDER 891	1		S
	*4	83901612	CARD HOLDER 891	1		S
	#4	83901614	CARD HOLDER 891	1		S
1-3	*5	83901651	CARRIAGE 891	1	WITHOUT NO.1-4	
	#5	87060560	CARRIAGE ASSY 891CLW	1	WITH NO.1-4	
1-4	*5	80210390	BUSHING 12X14X10	2		
1-5		80902050	TIMING BELT HTD102 364X3.2	1		
1-6		83100490	IDLER GEAR 43X63X0.3	1		S
1-7		83120450	RIBBON CASSETTE GEAR 891	1		S
1-8	*2	83100500	IDLER GEAR 16X1-40X0.3	1		S
	*8	83100501	IDLER GEAR 16X1-40X0.3	1		S
	#8	86312460	IDLER ASSY TRX	1		S
1-9	*1	83100540	IDLER GEAR 17X41X0.3	1		S
	#1	83100541	IDLER GEAR 17X41X0.3	1		S
1-10		82210031	WAVE WASHER 891	1		S
1-11		83400410	CLUTCH LEVER 891	1		S
1-12		87060610	PAPER FEED MOTOR ASSY 891	1	FOR VER.1.0	S
	#2	87060680	PAPER FEED MOTOR ASSY 891D	1	FOR VER.1.5	S
1-13		83100510	GEAR 40X0.5	1		S
1-14		83100520	IDLER GEAR 16X72X0.5	1		S
1-15	*2	00630404	SCREW TR 3-4	2	FOR TAPPED HOLE	S
	#2	01903064	SCREW TAT 3-5 CT	2	FOR NON-TAPPED HOLE	S
1-16	#1	02304025	POLY-SLIDER WP4X0.25	1		S
1-17	*5	80992220	FELT 891	1		

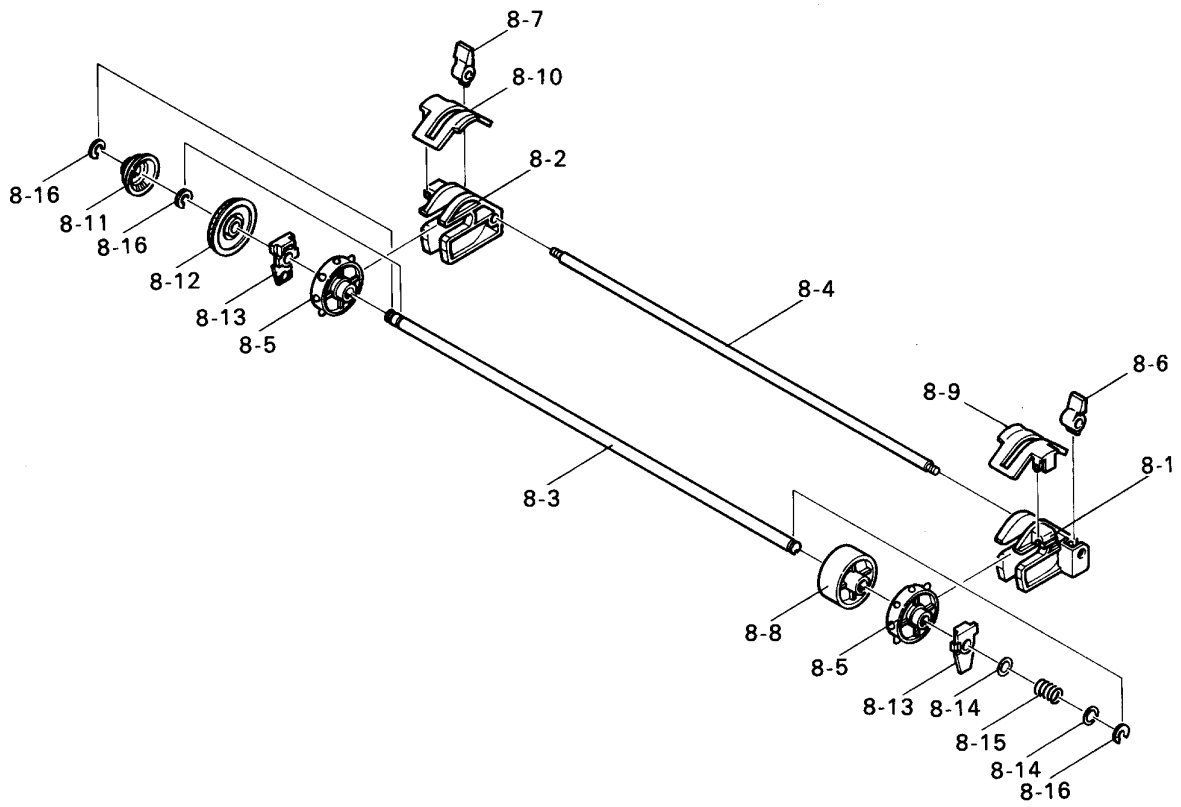
3-3-2. Colour Type



Frame Unit (Colour: Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1-1	*2	83910850	GEAR COVER	891	1	NOT REQUIRE 1-29,30	S
	#2	83910853	GEAR COVER	891	1	REQUIRE NO.1-29,30	S
1-2	*2	83901611	CARD HOLDER	891	1		S
	*4	83901613	CARD HOLDER	891	1		S
	#4	83901614	CARD HOLDER	891	1		S
1-3	*5	83901651	CARRIAGE	891	1	WITHOUT NO.1-4	
	#5	87060560	CARRIAGE ASSY	891CLW	1	WITH NO.1-4 (VER.1)	
	#5	87422320	CARRIAGE ASSY	711	1	WITH NO.1-4(VER.1.5)	
1-4	*5	80210390	BUSHING 12X14X10		2	FOR VER.1	
	*5	80210480	BUSHING 12X14X10	891B	2	FOR VER.1.5	
1-5		80902060	TIMING BELT HTD102 364X4.8		1		S
1-6	*2	83100490	IDLER GEAR 43X63X0.3		1		S
	#2	83101070	IDLER GEAR 43X63X0.3	891CL	1		S
1-7	*2	83120450	RIBBON CASSETTE GEAR	891	1		S
	#2	83120630	RIBBON CASSETTE GEAR	891CL	1		S
1-8	*2	83100500	IDLER GEAR 16X1-40X0.3		1	NOT REQUIRE NO.1-27	S
	*3	83101060	IDLER GEAR 16X1-40X0.3	891CL	1	REQUIRE NO.1-27	S
	#3	83101061	IDLER GEAR 16X1-40X0.3	891CL	1	REQUIRE NO.1-27	S
1-9	*2	83100540	IDLER GEAR 17X41X0.3		1		S
	#2	83100541	IDLER GEAR 17X41X0.3		1		S
1-10		82210031	WAVE WASHER	891	1		S
1-11		83400410	CLUTCH LEVER	891	1		S
1-12	*5	87060630	PAPER FEED MOTOR ASSY	891CL	1		S
	#5	87060610	PAPER FEED MOTOR ASSY	891	1		S
1-13		83100510	GEAR 40X0.5		1		S
1-14		83100520	IDLER GEAR 16X72X0.5		1		S
1-15	*2	00630404	SCREW TR 3-4		2	FOR TAPPED HOLE	S
	#2	01903064	SCREW TAT 3-5 CT		2	FOR NON-TAPPED HOLE	S
1-16		02304025	POLY-SLIDER WP4X0.25		1		S
1-17	*4	83200630	ADJUSTING HOLDER	891CL	1		S
	*5	83902830	ADJUSTING HOLDER	941CL	1		S
	#5	83200630	ADJUSTING HOLDER	891CL	1		S
1-18	*5	83290020	LIFT CAM	891CL	1		S
	#5	83290021	LIFT CAM	891CL	1		S
1-19		83400400	RIBBON CHANGE LEVER	891CL	2		S
1-20		83400431	LIFT LEVER	891CL	1		S
1-21	*2	83901640	COLOR RIBBON HOLDER	891CL	1		S
	*5	83901641	COLOR RIBBON HOLDER	891CL	1		S
	#5	83901642	COLOR RIBBON HOLDER	891CL	1		S
1-22		80510680	SPRING E030-026-0106		2		S
1-23		80520341	SPRING C065-040-0220		1		S
1-24	*2	81250170	ADJUSTING SCREW B	891CL	1	FOR OLD TYPE ONLY	S
1-25	*2	81250180	ADJUSTING SCREW A	891CL	1	FOR OLD TYPE ONLY	S
1-26	*5	80992220	FELT	891	1		
1-27	#2	81210250	BUSHING 4X5X6	891CL	1		S
1-28	#2	82501010	CLUTCH SPRING	891CL	1		
1-29	#2	01902024	SCREW TAT 2-6		1		
1-30	#2	02040402	FLANGED NUT NHW4		1		S
1-31	#2	82210070	ADJUSTING SPACER	891CL	1		S

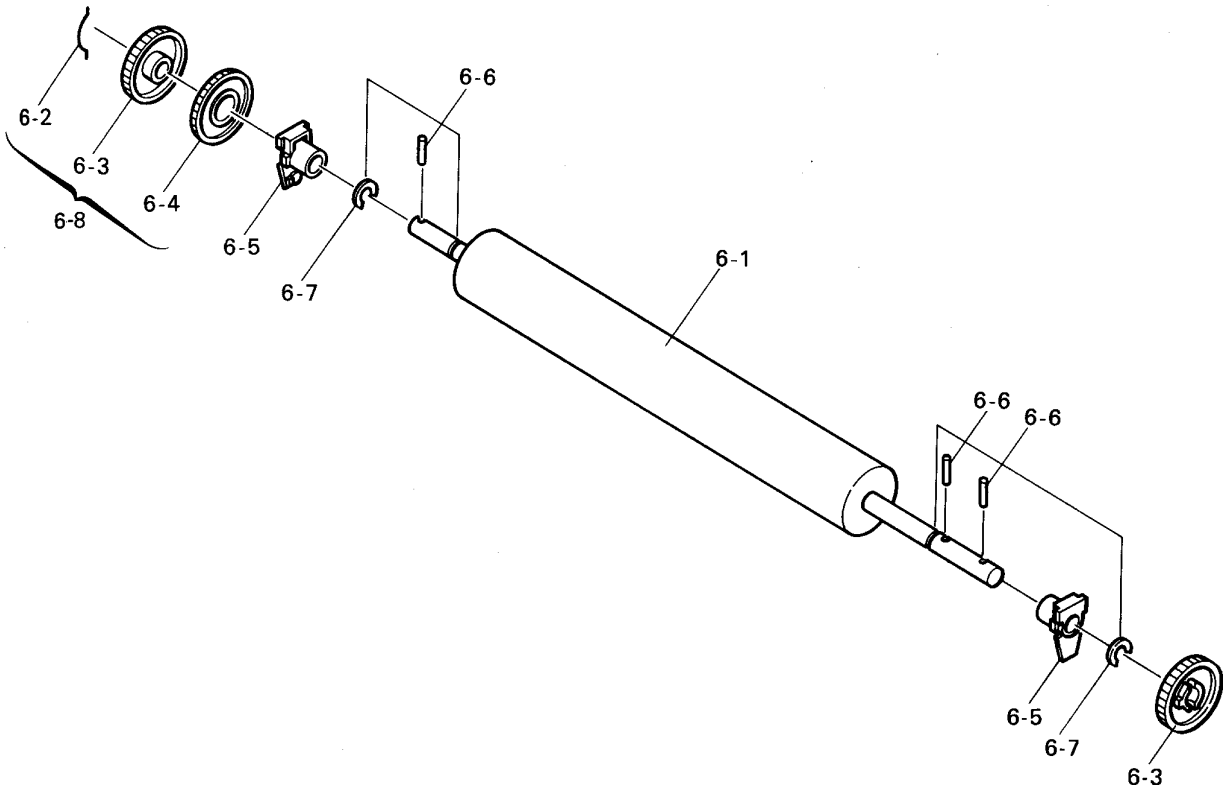
3-4. Tractor Unit



Tractor Unit (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
8-1		83901620	TRACTOR HOLDER R 891	1		S
8-2		83901631	TRACTOR HOLDER L 891	1		S
8-3	*6	81380440	TRACTOR SHAFT 891	1		
	#6	81380442	TRACTOR SHAFT 891	1		
8-4	*2	81370520	TRACTOR STAY 891	1		
	*5	81370521	TRACTOR STAY 891	1		
	#5	81370522	TRACTOR STAY 891	1		
8-5		83110110	SPROCKET WHEEL 891	2		S
8-6		83400311	CLAMP LEVER R 831	1		S
8-7		83400321	CLAMP LEVER L 831	1		S
8-8	*6	83901600	SHEET GUIDE 891	1		
	#6	83901601	SHEET GUIDE 891	1		
8-9	*2	83910860	TRACTOR COVER R 891	1		S
	#2	83910861	TRACTOR COVER R 891	1		S
8-10	*2	83910870	TRACTOR COVER L 891	1		S
	#2	83910871	TRACTOR COVER L 891	1		S
8-11		83110100	TRACTOR CLUTCH 891	1		S
8-12		83100530	TRACTOR GEAR 64X0.5	1		S
8-13	*6	83200650	TRACTOR BUSHING 891	2		
	#6	83200651	TRACTOR BUSHING 891	2		
8-14		02307050	POLY-SLIDER WP7X0.5	2		S
8-15	*6	80520350	SPRING C090-070-0130	1		S
	#6	80520351	SPRING C090-070-0130	1		S
8-16	*2	04020012	STOP RING SE5.0	3		S
	#2	04020017	STOP RING SE5.0	3		S

3-5. Platen Unit

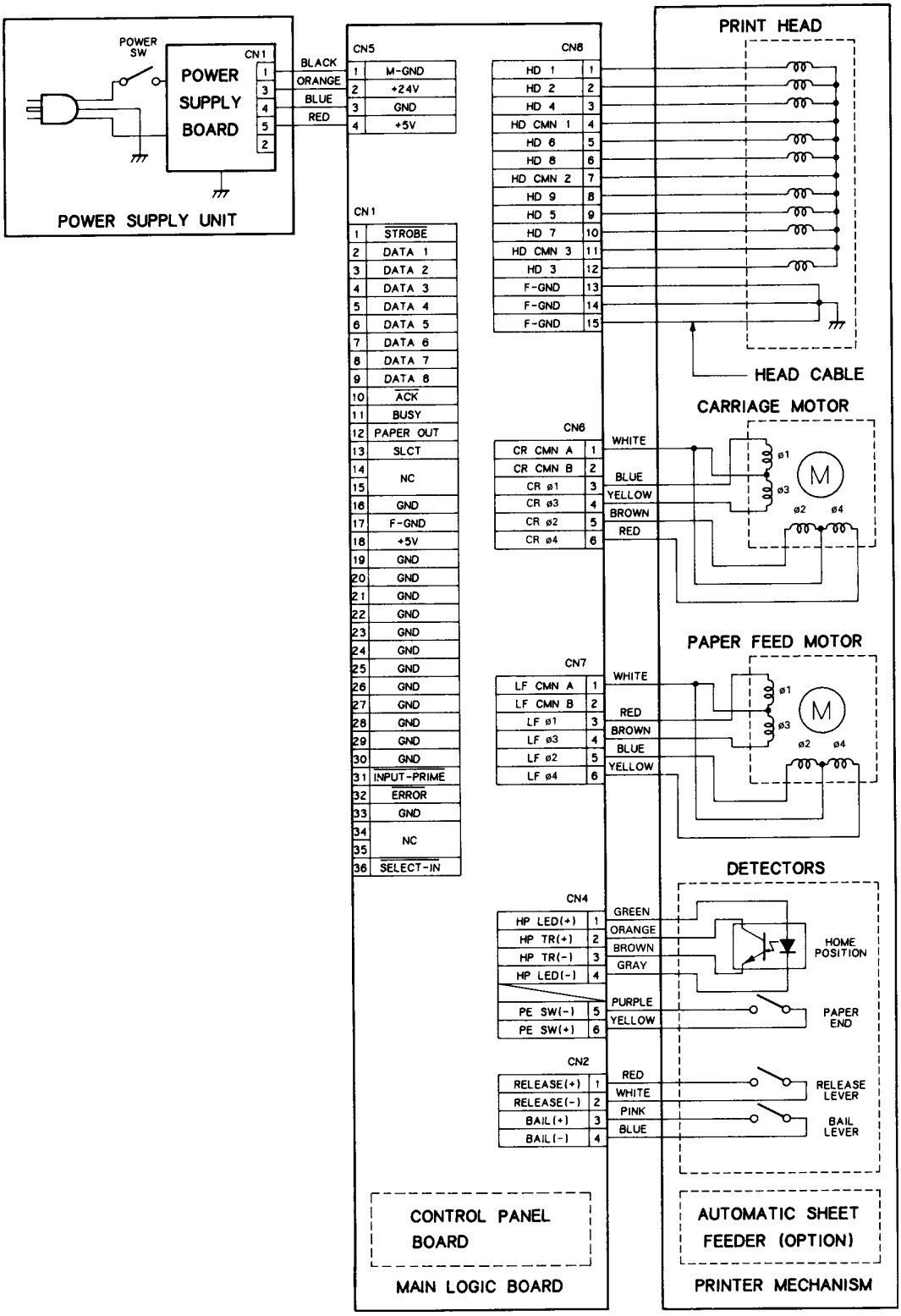


Platen Unit (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
6-1	*7	80202030	PLATEN 891	1		
	#7	80202031	PLATEN 891	1		
6-2		80530520	PLATEN GEAR SPRING 891	1		S
6-3		83100550	PLATEN GEAR A 891	2		S
6-4		83100560	PLATEN GEAR B 891	1		S
6-5	*2	83200660	PLATEN HOLDER 891	2		S
	*4	83200661	PLATEN HOLDER 891	2		S
	#4	83200662	PLATEN HOLDER 891	2		S
6-6		04012502	ROLL PIN SP2.5X12	3		S
6-7	*4	04020014	STOP RING SE6.0	2		S
	#4	04020022	STOP RING SE6.0-SUS	2		S
6-8	#5	87063340	PLATEN GEAR ASSY 891B	1	WITH NO.6-2,3,4	S

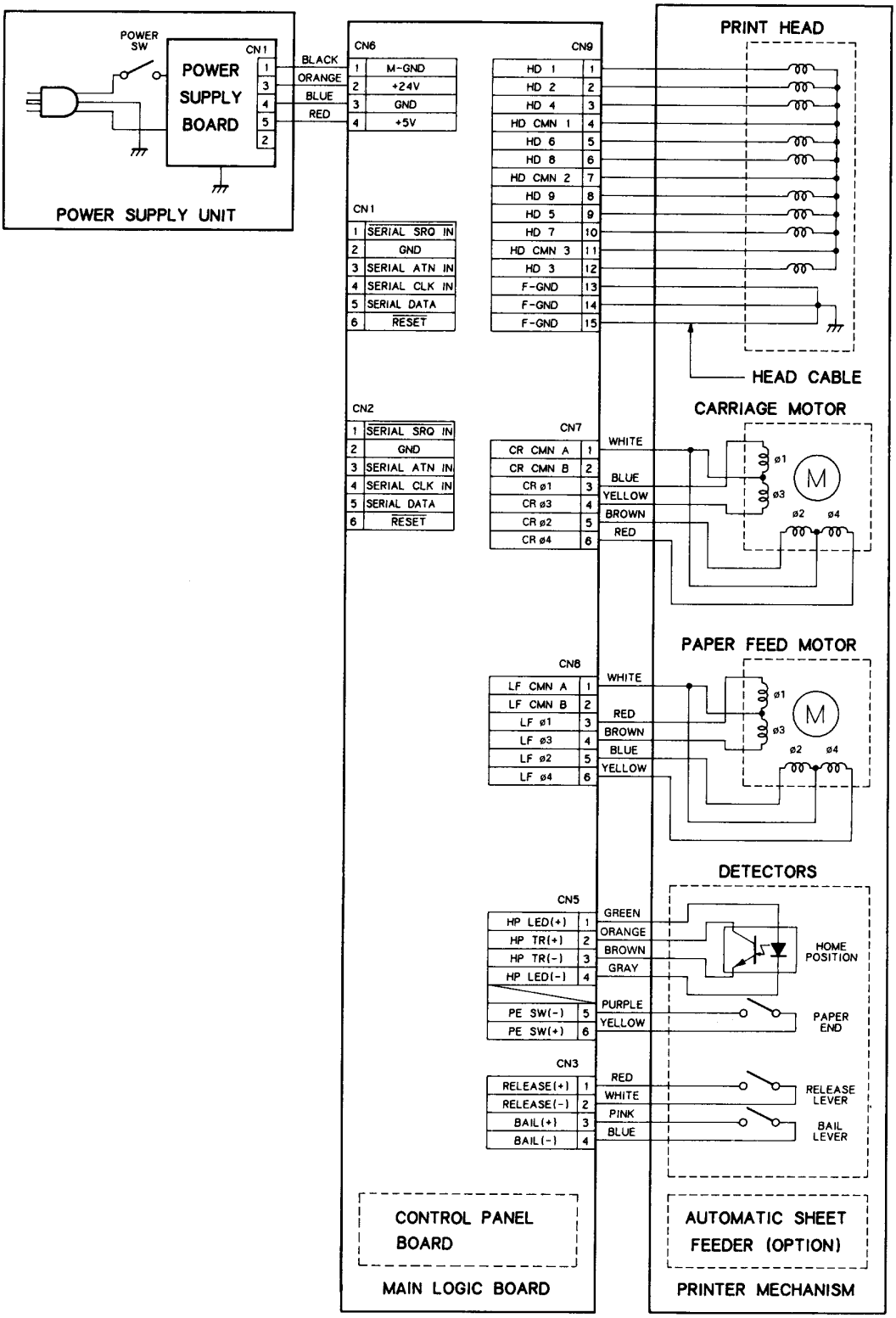
4. Wiring Scheme of Printer (Ver. 1 and 1.5)

4-1. Parallel Type



WIRING SCHEME

4-2. Commodore Type



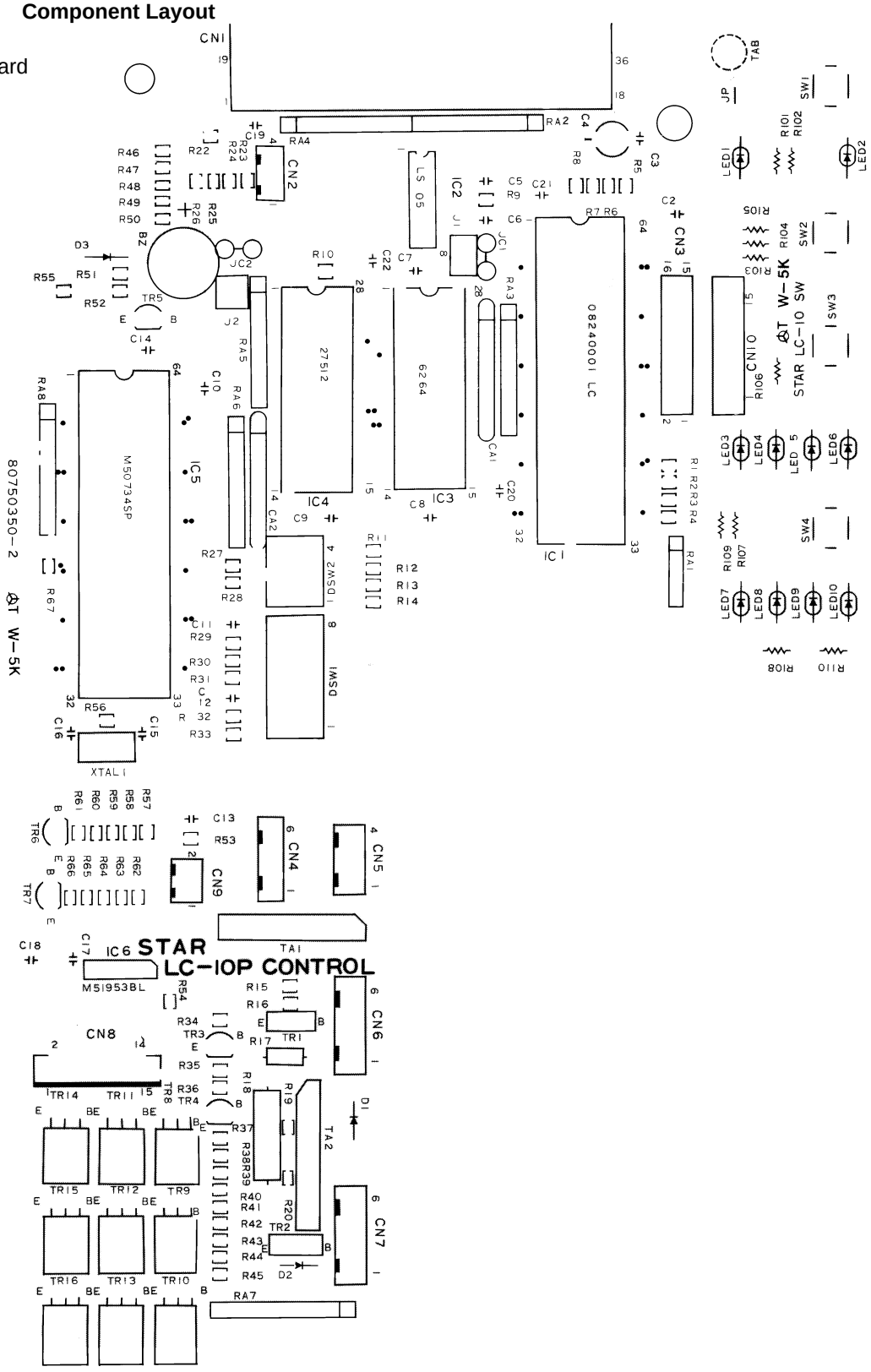
WIRING SCHEME

5. Main Logic Board (Ver. 1 and 1.5)

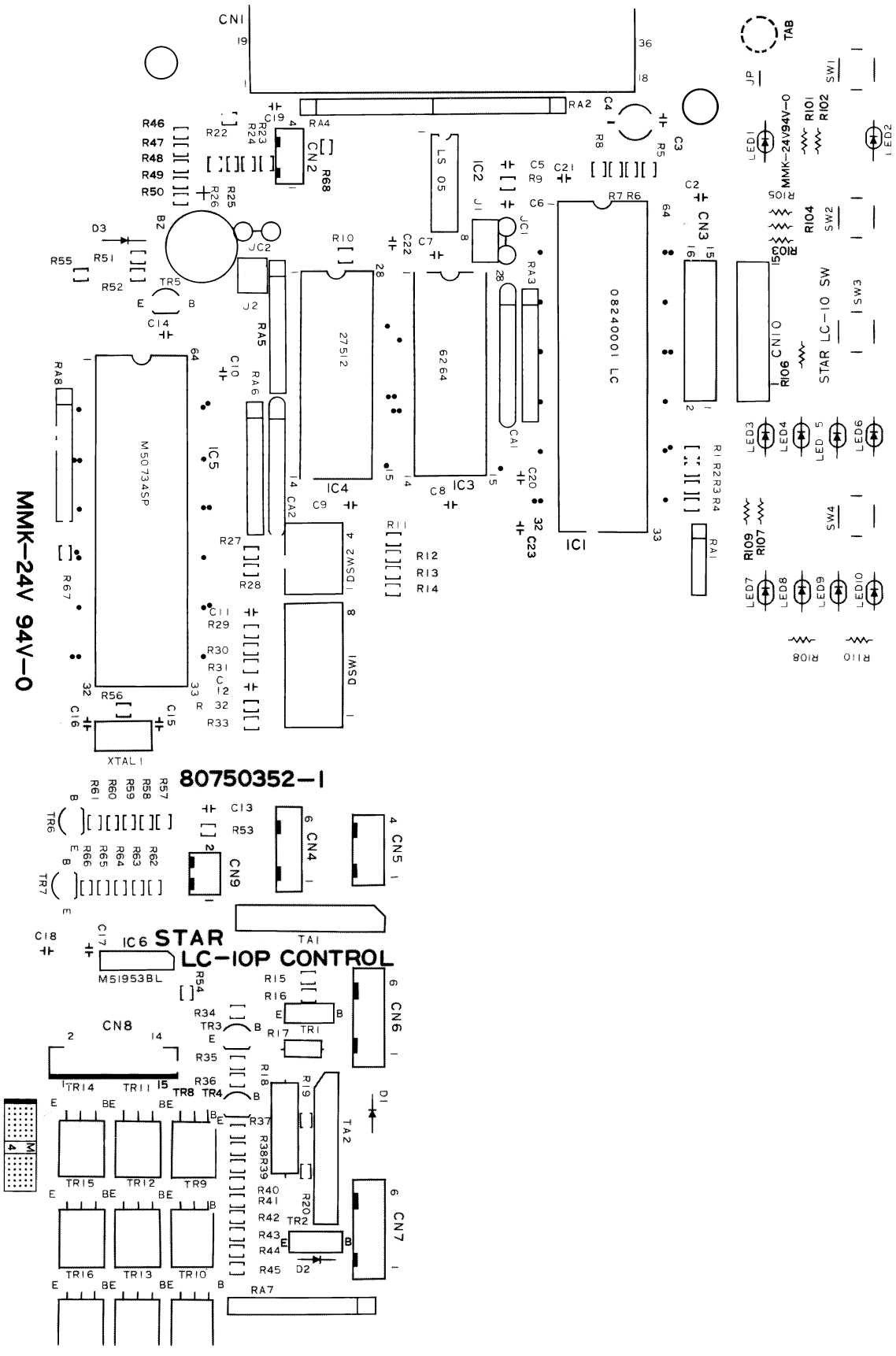
5-1. Parallel Type (Ver. 1)

5-1-1. Component Layout

A. Board



B. Board


MMK-24V 94V-0
80750352-1
STAR LC-10P CONTROL
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
IC1
IC2
IC3
IC4
IC5
IC6
M51953BL
M50734SP
27512
6264
08240001 LC
LS 05
XTAL1
TAB
JP
SW1
SW2
SW3
SW4
STAR LC-10 SW
MMK-24V94V-0
TR1
TR2
TR3
TR4
TR5
TR6
TR7
TR8
TR9
TR10
TR11
TR12
TR13
TR14
TR15
TR16
TA1
TA2
RA1
RA2
RA3
RA4
RA5
RA6
RA7
RA8
DSW1
DSW2
LED1
LED2
LED3
LED4
LED5
LED6
LED7
LED8
LED9
LED10
D1
D2
D3
BZ

5-1-2. Parts List Main Logic Board (Parallel Type Ver.1)

Main Logic Board (Parallel Type Ver.1)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1		08240001	GATE ARRAY D65006CW-LC	1		S
IC2		08210017	TTL IC 74LS05	1		
IC3		08221002	SRAM HM6264P-100NS	1	FOR MONO	S
	#1	08221007	PSRAM HM65256BLP-100NS	1	FOR CL	S
IC4		08220116	EPROM 27512-150NS	1	NX1P.1* :FOR MONO	S
	#1	08220116	EPROM 27512-150NS	1	NX1P.1*.CL :FOR CL	S
	#4	08220116	EPROM 27512-150NS	1	NX1P.1*.SUCL :FOR SU	S
IC5		08250001	CPU M50734SP-10	1		S
IC6		08200109	IC-RESET M51953BL	1		S
TA1-2		07650029	TRANSISTOR ARRAY MP4001	2		S
TR1-2		07110121	TRANSISTOR 2SB1012K	2		S
TR3		07227853	TRANSISTOR 2SC1740SE	1		
TR4		07011752	TRANSISTOR 2SA1266*	1		
TR5-7		07227853	TRANSISTOR 2SC1740SE	3		
TR8-16		07316371	TRANSISTOR 2SD1637	9		S
D1-2		08000044	DIODE 1SR139-100AT	2		
D3	*8	08000039	DIODE 1S1588	1		
	#8	08000096	DIODE 1S2076A*A	1		
RA1	*2	06584721	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
	#2	06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA2	*2	06584723	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
	#2	06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
RA3					NOT MOUNTED	
RA4	*2	06584723	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
	#2	06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
RA5	*2	06581032	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
	#2	06581038	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
RA6					NOT MOUNTED	
RA7	*2	06581022	RESIS. ARRAY 1 K-OHM 1/8W 9EL	1		
	#2	06581028	RESIS. ARRAY 1 K-OHM 1/8W 9EL	1		
RA8	*2	06584723	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
	#2	06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
R1-9		06054725	RD RESISTOR 4.7 K-OHM 1/6W	9		
R10					NOT MOUNTED	
R11		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R12		06058224	RD RESISTOR 8.2 K-OHM 1/6W	1		
R13		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R14		06058224	RD RESISTOR 8.2 K-OHM 1/6W	1		
R15-16		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R17		06022206	RD RESISTOR 22 OHM 1/2W	1		
R18	*2	06200271	RN RESISTOR 2.7 OHM 2W 2%	1		
	#2	06200274	RN RESISTOR 2.7 OHM 2W 2%	1		
R19-20		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R21					NOT USED	
R22					NOT MOUNTED	
R23-31		06054725	RD RESISTOR 4.7 K-OHM 1/6W	9		
R32		06054734	RD RESISTOR 47 K-OHM 1/6W	1		
R33		06051514	RD RESISTOR 150 OHM 1/6W	1		
R34		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R35		06052224	RD RESISTOR 2.2 K-OHM 1/6W	1		
R36		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R37-45		06053314	RD RESISTOR 330 OHM 1/6W	9		
R46-49		06054725	RD RESISTOR 4.7 K-OHM 1/6W	4		
R50		06051014	RD RESISTOR 100 OHM 1/6W	1		
R51		06051514	RD RESISTOR 150 OHM 1/6W	1		
R52		06051034	RD RESISTOR 10 K-OHM 1/6W	1		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R53					NOT MOUNTED	
R54		06051525	RD RESISTOR 1.5 K-OHM 1/6W	1		
R55		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R56		06051051	RD RESISTOR 1 M-OHM 1/6W	1		
R57-60		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
R61		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R62-65		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
R66		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R67		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R68	*2	06041521	RD RESISTOR 1.5 K-OHM 1/4W	1		
	#2	06051525	RD RESISTOR 1.5 K-OHM 1/6W	1		
R101-110		06052714	RD RESISTOR 270 OHM 1/6W	10		
CA1		05654711	CAPA. ARRAY 470PF 50V 8EL	1	FOR MONO	
	#2	05653311	CAPA. ARRAY 330PF 50V 8EL	1	FOR CL	
CA2		05651012	CAPA. ARRAY 100PF 50V 8EL	1		
C1					NOT USED	
C2		05152234	CERA. CAPA. 0.022UF 50V	1		
C3					NOT MOUNTED	
C4		05051062	CHEM. CAPA. 10UF 50V	1		
C5		05154714	CERA. CAPA. 470PF 50V	1		
C6		05154714	CERA. CAPA. 470PF 50V	1	FOR MONO	
	#2	05151015	CERA. CAPA. 100PF 50V	1	FOR CL	
C7		05152234	CERA. CAPA. 0.022UF 50V	1		
C8					NOT MOUNTED	
C9		05152234	CERA. CAPA. 0.022UF 50V	1		
C10		05154723	CERA. CAPA. 4700PF 50V	1		
C11					NOT MOUNTED	
C12		05154714	CERA. CAPA. 470PF 50V	1		
C13					NOT MOUNTED	
C14		05152234	CERA. CAPA. 0.022UF 50V	1		
C15-16		05153303	CERA. CAPA. 33PF 50V	2		
C17		05152234	CERA. CAPA. 0.022UF 50V	1		
C18	*2	05131042	CERA. CAPA. 0.1UF 25V	1		
	#2	05551044	CAPACITOR 0.1UF 50V	1		
C19-20		05152234	CERA. CAPA. 0.022UF 50V	2		
C21		05152212	CERA. CAPA. 220PF 50V	1		
C22		05152234	CERA. CAPA. 0.022UF 50V	1		
C23	#2	05152212	CERA. CAPA. 220PF 50V	1	FOR CL ONLY	
C24	#2	05151013	CERA. CAPA. 100PF 50V	1	FOR CL ONLY	
XTAL1		09250032	CERA. OSCILLATOR KBR10MHZ	1		
BZ		45060201	QMB-111P	1		
DSW1	*2	09090018	DIP SWITCH KSD08	1		
	#2	09090034	DIP SWITCH KSS08-1	1		
DSW2	*2	09090016	DIP SWITCH KSD04	1		
	#2	09090033	DIP SWITCH KSS04-1	1		
SW1-4	*2	09010041	PUSH SWITCH SKHHAL	4		
	#2	09010043	PUSH SWITCH SKHHAL=S	4		
LED1		08300055	LED LT-1H11A	1		
LED2-9		08300058	LED LT-1E21A	8		
LED10		08300055	LED LT-1H11A	1		
JC1	#1				NOT MOUNTED:FOR MONO	
	#1	93930006	JUMPER WIRE STP122	1	:FOR CL	
JC2					NOT MOUNTED	
CN1		09100155	CONNECTOR 57L-40360-770B-D147	1		
CN2	*4	09100342	CONNECTOR 53014-0410	1		
	*6	09100476	CONNECTOR 53014-0470	1		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
CN2	#6	09100342	CONNECTOR 53014-0410	1		
CN3		09100339	CONNECTOR FC-16	1		
CN4	*4	09100341	CONNECTOR 53014-0610	1		
	*6	09100474	CONNECTOR 53014-0670	1		
	#6	09100341	CONNECTOR 53014-0610	1		
CN5		09100317	CONNECTOR 5483-04A	1		
CN6		09100267	CONNECTOR 5483-06A	1		
CN7		09100278	CONNECTOR 5483-06A-RED	1		
CN8	*2	09100340	CONNECTOR HLEM15S-1	1		
	#2	09100384	CONNECTOR HLEM15S-2	1		
CN9					NOT MOUNTED	
CN10		09100339	CONNECTOR FC-16	1		
-		80700250	WIRE 18UL1007BLK055T	1		

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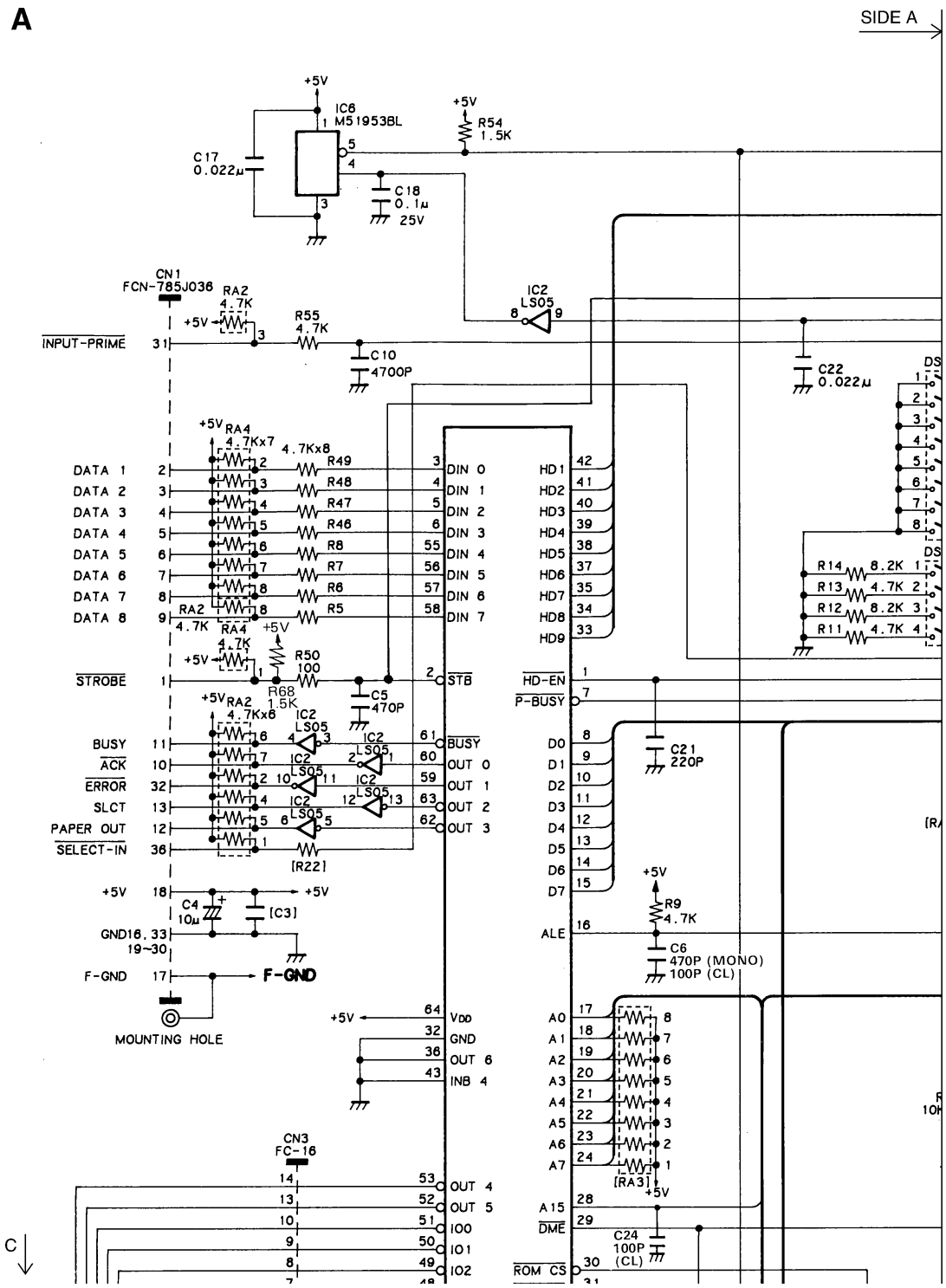
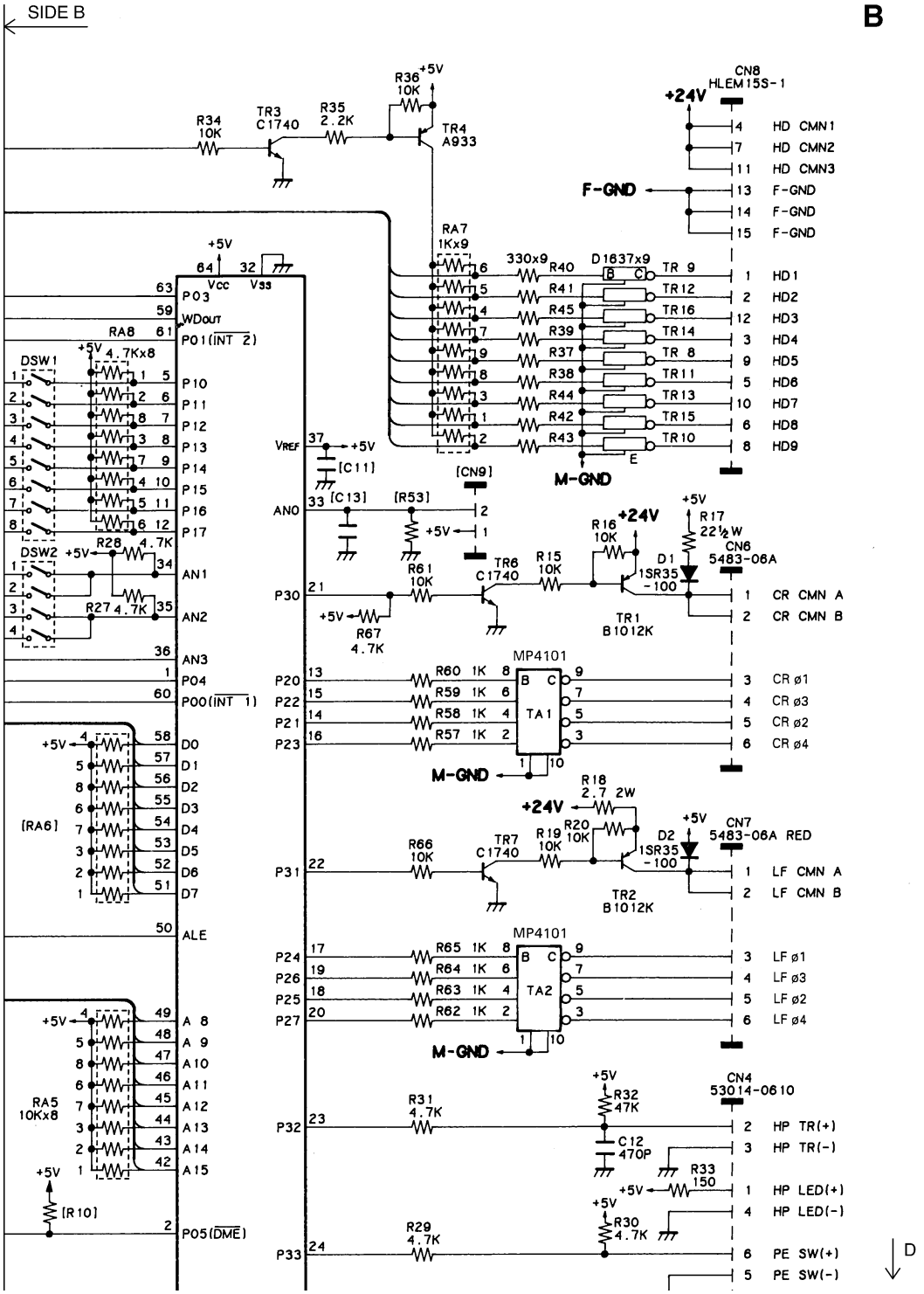
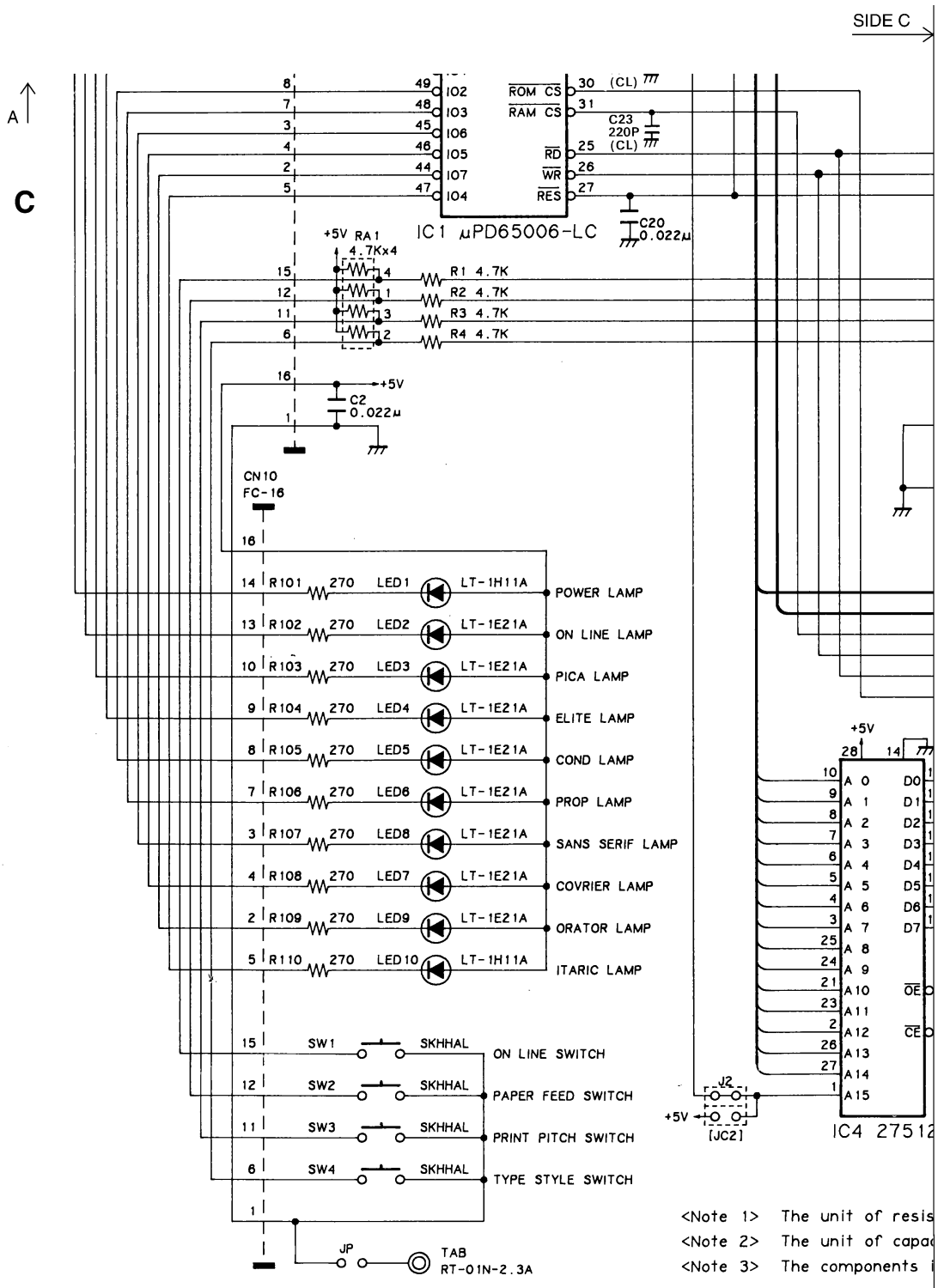
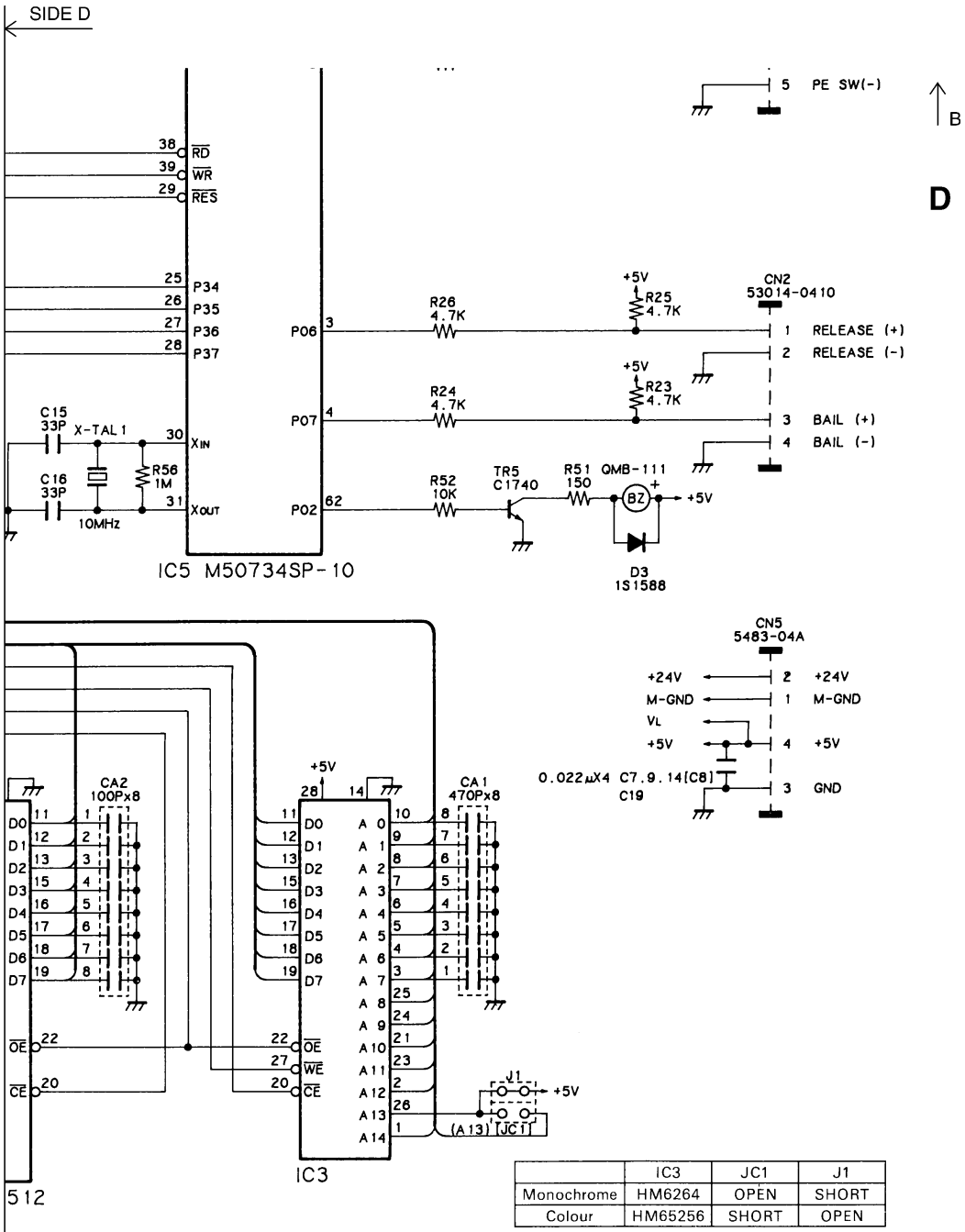
5-1-3. Circuit Diagram (Ver.1)




SIDE B
B
D
R36 10K +5V
R34 10K
TR3 C1740
R35 2.2K
TR4 A933
CN8 HLEM15S-1
+24V
4 HD CMN1
7 HD CMN2
11 HD CMN3
F-GND
13 F-GND
14 F-GND
15 F-GND
RA7 1Kx9
330x9 R40
D1637x9
TR 9
TR12
TR16
TR14
TR 8
TR11
TR13
TR15
TR10
1 HD1
2 HD2
12 HD3
3 HD4
9 HD5
5 HD6
10 HD7
6 HD8
8 HD9
M-GND
+5V
64 Vcc
32 Vss
63 P03
59 WDOUT
RA8 61 P01(INT 2)
DSW1
+5V 4.7Kx8
P10
P11
P12
P13
P14
P15
P16
P17
VREF 37 +5V
[C11]
[CN9]
AN0 33 [C13]
[R53]
DSW2
R28 4.7K
34 AN1
R27 4.7K
35 AN2
36 AN3
1 P04
60 P00(INT 1)
R61 10K
R67 4.7K
P30 21
TR6 C1740
R15 10K
R16 10K
D1 1SR35-100
R17 22½W
CN6 5483-06A
1 CR CMN A
2 CR CMN B
TR1 B1012K
MP4101
P20 13 R60 1K
P22 15 R59 1K
P21 14 R58 1K
P23 16 R57 1K
TA1
3 CR ø1
4 CR ø3
5 CR ø2
6 CR ø4
M-GND
R18 2.7 2W
+24V
R20 10K
R19 10K
TR7 C1740
R66 10K
P31 22
D2 1SR35-100
CN7 5483-06A RED
1 LF CMN A
2 LF CMN B
TR2 B1012K
MP4101
P24 17 R65 1K
P26 19 R64 1K
P25 18 R63 1K
P27 20 R62 1K
TA2
3 LF ø1
4 LF ø3
5 LF ø2
6 LF ø4
M-GND
[RA6]
58 D0
57 D1
56 D2
55 D3
54 D4
53 D5
52 D6
51 D7
50 ALE
RA5 10Kx8
49 A 8
48 A 9
47 A10
46 A11
45 A12
44 A13
43 A14
42 A15
[R10]
2 P05(DME)
R31 4.7K
P32 23
R32 47K
C12 470P
R33 150
CN4 53014-0610
2 HP TR(+)
3 HP TR(-)
1 HP LED(+)
4 HP LED(-)
R30 4.7K
R29 4.7K
P33 24
6 PE SW(+)
5 PE SW(-)


SIDE C
A
C
IC1 μPD65006-LC
ROM CS
RAM CS
RD
WR
RES
C23 220P (CL)
C20 0.022μ
+5V RA1 4.7Kx4
R1 4.7K
R2 4.7K
R3 4.7K
R4 4.7K
C2 0.022μ
CN10 FC-16
R101 270 LED1 LT-1H11A POWER LAMP
R102 270 LED2 LT-1E21A ON LINE LAMP
R103 270 LED3 LT-1E21A PICA LAMP
R104 270 LED4 LT-1E21A ELITE LAMP
R105 270 LED5 LT-1E21A COND LAMP
R106 270 LED6 LT-1E21A PROP LAMP
R107 270 LED8 LT-1E21A SANS SERIF LAMP
R108 270 LED7 LT-1E21A COVRIER LAMP
R109 270 LED9 LT-1E21A ORATOR LAMP
R110 270 LED10 LT-1H11A ITARIC LAMP
SW1 SKHHAL ON LINE SWITCH
SW2 SKHHAL PAPER FEED SWITCH
SW3 SKHHAL PRINT PITCH SWITCH
SW4 SKHHAL TYPE STYLE SWITCH
JP
TAB RT-01N-2.3A
J2
[JC2]
IC4 27512
<Note 1> The unit of resis
<Note 2> The unit of capa
<Note 3> The components i



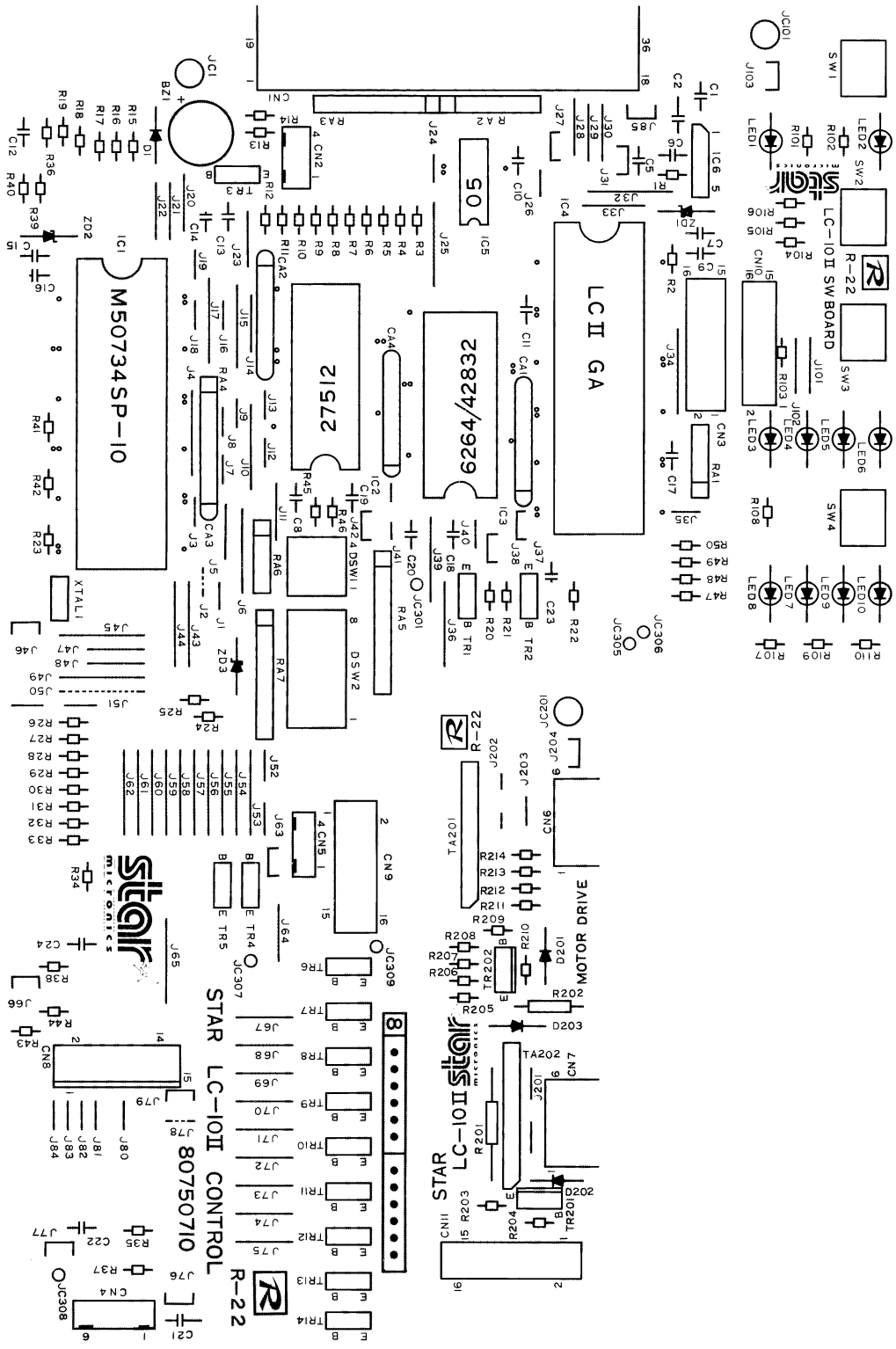
	IC3	JC1	J1
Monochrome	HM6264	OPEN	SHORT
Colour	HM65256	SHORT	OPEN

esistor and resistor array is " Ω ", and no indication of wattage means 1/6W, 1/8W respectively.
apacitor is "F", and no indication of voltage means 50V.
ts in bracket are not installed the board.

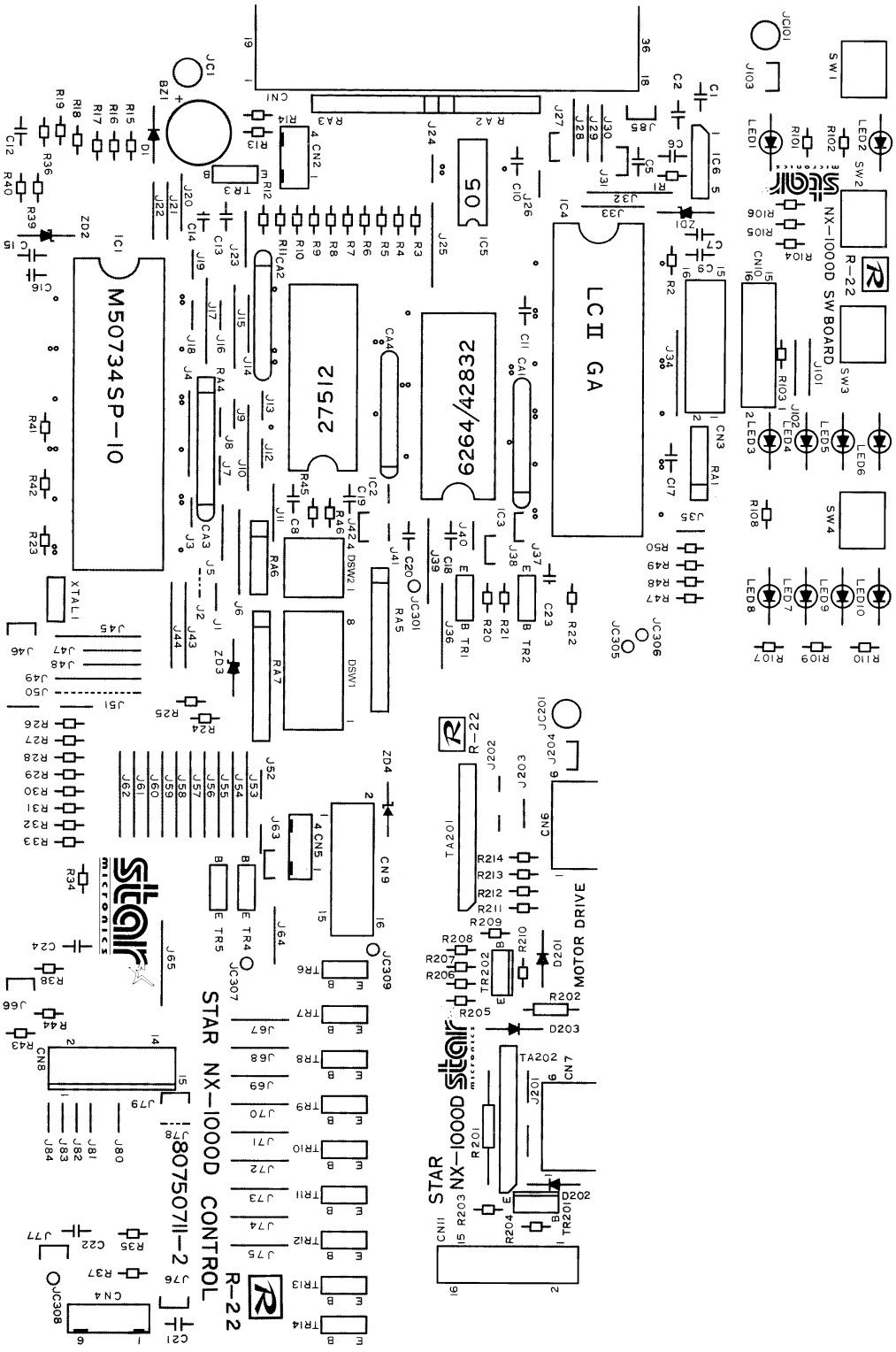
MAIN LOGIC BOARD (PARALLEL TYPE VER. 1)

5-2. Parallel Type (Ver.1.5)

5-2-1. Component Layout (A Board)



5-2-1. Component Layout (B Board)



5-2-2. Parts List

Main Logic Board (Parallel Type Ver.1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1		08250001	CPU M50734SP-10	1		S
IC2		08220116	EPROM 27512-150NS	1	NX1P.2* :FOR MONO	S
		08220116	EPROM 27512-150NS	1	NX1P.2*.CL :FOR CL	S
IC3		08221002	SRAM HM6264P-100NS	1		S
IC4		08240013	GATE ARRAY D65006CW-LC2	1		S
IC5		08210017	TTL IC 74LS05	1		
IC6		08200109	IC-RESET M51953BL	1		S
TA201-202	*4	07650031	TRANSISTOR ARRAY STA401A	2		S
	#4	07650040	TRANSISTOR ARRAY MP4101	2		S
TR1		07011752	TRANSISTOR 2SA1266*	1		
TR2-5		07227853	TRANSISTOR 2SC1740SE	4		
TR6-14		07320101	TRANSISTOR 2SD2010	9		S
TR201-202		07113591	TRANSISTOR 2SB1359	2		S
D1	*8	08000039	DIODE 1S1588	1		
	#8	08000096	DIODE 1S2076A*A	1		
D201-202		08000044	DIODE 1SR139-100AT	2		
D203	#2	93930006	JUMPER WIRE STP122	1		
RA1		06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA2	*3	06584728	RESIS. ARRAY 4.7K-OHM 1/8W 6EL	1		
	*4	06581824	RESIS. ARRAY 1.8K-OHM 1/8W 6EL	1		
	#4	06581823	RESIS. ARRAY 1.8K-OHM 1/8W 6EL	1		
RA3		06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
RA4					NOT MOUNTED	
RA5		06581028	RESIS. ARRAY 1 K-OHM 1/8W 9EL	1		
RA6		06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA7		06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
R1		06051525	RD RESISTOR 1.5 K-OHM 1/6W	1		
R2-10		06054725	RD RESISTOR 4.7 K-OHM 1/6W	9		
R11	*3	06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
	#3	06051025	RD RESISTOR 1 K-OHM 1/6W	1		
R12		06051014	RD RESISTOR 100 OHM 1/6W	1		
R13		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R14	*3	06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
	#3	06051025	RD RESISTOR 1 K-OHM 1/6W	1		
R15		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R16		06051514	RD RESISTOR 150 OHM 1/6W	1		
R17-19		06054725	RD RESISTOR 4.7 K-OHM 1/6W	3		
R20		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R21		06052224	RD RESISTOR 2.2 K-OHM 1/6W	1		
R22		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R23		06051051	RD RESISTOR 1 M-OHM 1/6W	1		
R24-25		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R26-34		06053314	RD RESISTOR 330 OHM 1/6W	9		
R35		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R36		06054734	RD RESISTOR 47 K-OHM 1/6W	1		
R37		06051514	RD RESISTOR 150 OHM 1/6W	1		
R38					NOT MOUNTED	
R39-42		06054725	RD RESISTOR 4.7 K-OHM 1/6W	4		
R43-44	#2				NOT MOUNTED	
R45		06058224	RD RESISTOR 8.2 K-OHM 1/6W	1		
R46-50		06054725	RD RESISTOR 4.7 K-OHM 1/6W	5		
R101-110		06052714	RD RESISTOR 270 OHM 1/6W	10		
R201		06200274	RN RESISTOR 2.7 OHM 2W 2%	1		
R202		06022206	RD RESISTOR 22 OHM 1/2W	1		
R203-204		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R205-208		06051025	RD RESISTOR 1 K-OHM 1/6W	4		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R209-210		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R211-214		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
CA1		05652212	CAPA. ARRAY 220PF 50V 8EL	1		
CA2-4		05651012	CAPA. ARRAY 100PF 50V 8EL	3		
C1		05152234	CERA. CAPA. 0.022UF 50V	1		
C2					NOT MOUNTED :FOR HK	
		05254732	FILM CAPA. 0.047UF 50V	1	EXCEPT FOR HK	
C3-4					NOT USED	
C5		05532234	CAPACITOR 0.022UF 25V	1		
C6		05551044	CAPACITOR 0.1UF 50V	1		
C7		05152234	CERA. CAPA. 0.022UF 50V	1		
C8		05552214	CAPACITOR 220PF 50V	1		
C9	*4	05154714	CERA. CAPA. 470PF 50V	1		
	#4	05554714	CAPACITOR 470PF 50V	1		
C10		05532234	CAPACITOR 0.022UF 25V	1		
C11		05554714	CAPACITOR 470PF 50V	1		
C12	*4	05154723	CERA. CAPA. 4700PF 50V	1		
	#4	05524724	CAPACITOR 4700PF 16V	1		
C13					NOT MOUNTED	
C14		05532234	CAPACITOR 0.022UF 25V	1		
C15-16		05152212	CERA. CAPA. 220PF 50V	2		
C17-19		05532234	CAPACITOR 0.022UF 25V	3		
C20		05552214	CAPACITOR 220PF 50V	1		
C21					NOT MOUNTED :FOR HK	
		05254732	FILM CAPA. 0.047UF 50V	1	EXCEPT FOR HK	
C22		05554714	CAPACITOR 470PF 50V	1		
C23		05154714	CERA. CAPA. 470PF 50V	1		
XTAL1		09250035	CERA. OSCILLATOR CST10.0MT	1		
BZ1		45060201	QMB-111P	1		
DSW1		09090034	DIP SWITCH KSS08-1	1		
DSW2		09090033	DIP SWITCH KSS04-1	1		
SW1-4		09010043	PUSH SWITCH SKHHAL=S	4		
LED1		08300055	LED LT-1H11A	1		
LED2-9		08300058	LED LT-1E21A	8		
LED10		08300055	LED LT-1H11A	1		
JC1		80700250	WIRE 18UL1007BLK055T	1		
JC101		80924670	WIRE 20UL1015BLK100	1		
JC201		80924670	WIRE 20UL1015BLK100	1		
CN1		09100155	CONNECTOR 57L-40360-770B-D147	1		
CN2	*4	09100342	CONNECTOR 53014-0410	1		
	*6	09100476	CONNECTOR 53014-0470	1		
	#6	09100342	CONNECTOR 53014-0410	1		
CN3		09100339	CONNECTOR FC-16	1		
CN4	*4	09100341	CONNECTOR 53014-0610	1		
	*6	09100474	CONNECTOR 53014-0670	1		
	#6	09100341	CONNECTOR 53014-0610	1		
CN5		09100317	CONNECTOR 5483-04A	1		
CN6		09100404	CONNECTOR 5483-06A-BLK	1		
CN7		09100278	CONNECTOR 5483-06A-RED	1		
CN8		09100384	CONNECTOR HLEM15S-2	1		
CN9-11		09100339	CONNECTOR FC-16	3		
J1		93930006	JUMPER WIRE STP122	1		
J2					NOT MOUNTED	
J3-49		93930006	JUMPER WIRE STP122	47		
J50					NOT MOUNTED	
J51-77		93930006	JUMPER WIRE STP122	27		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
J78					NOT MOUNTED	
J79-85		93930006	JUMPER WIRE STP122	7		
J101-103		93930006	JUMPER WIRE STP122	3		
J201-204		93930006	JUMPER WIRE STP122	4		
-	#4	80702221	CABLE UNIT 16X150	2	FOR CN3-10,CN9-11	
	*6	80086510	BOARD ID SEAL HK	1	ONLY HK	

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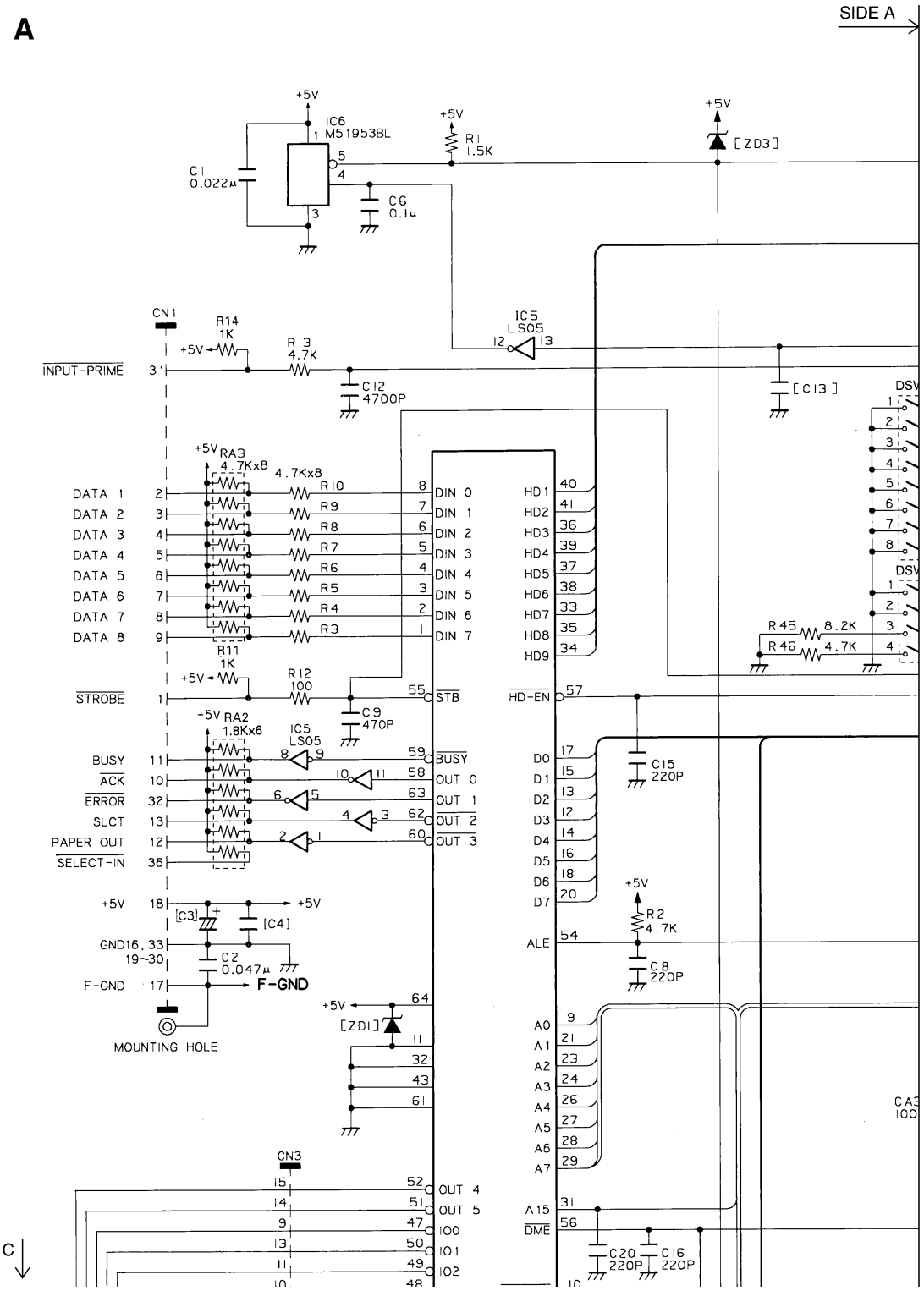
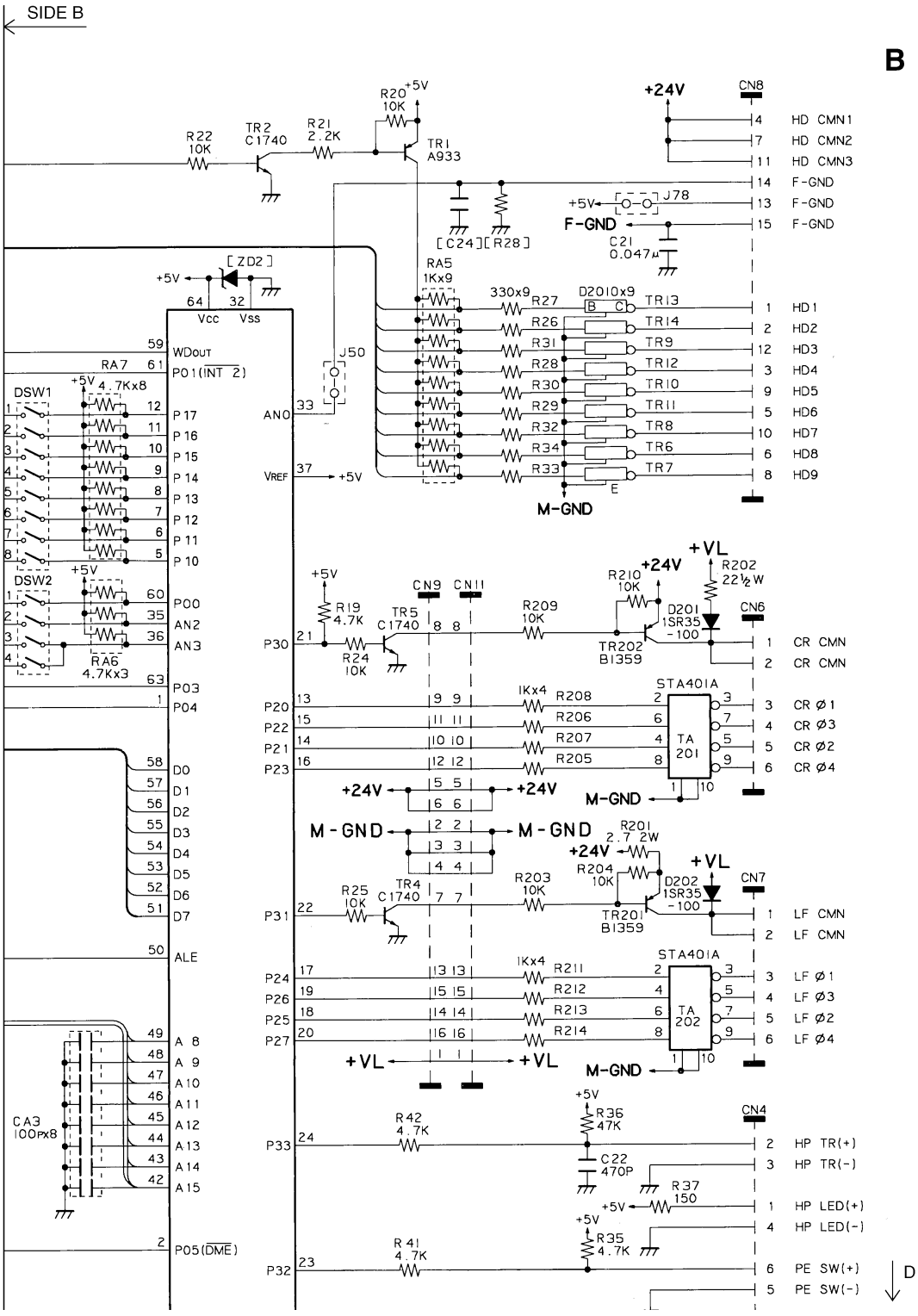
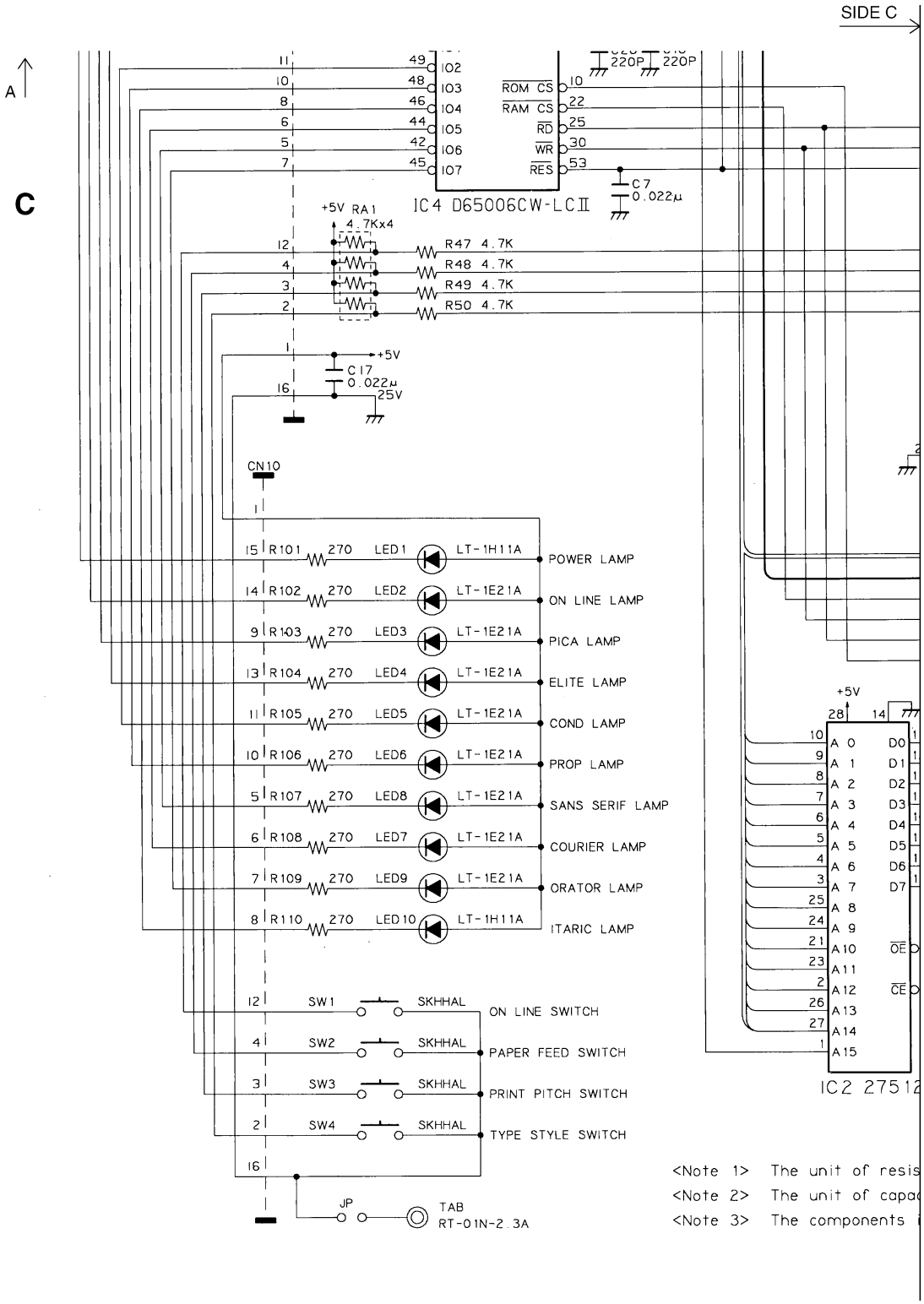
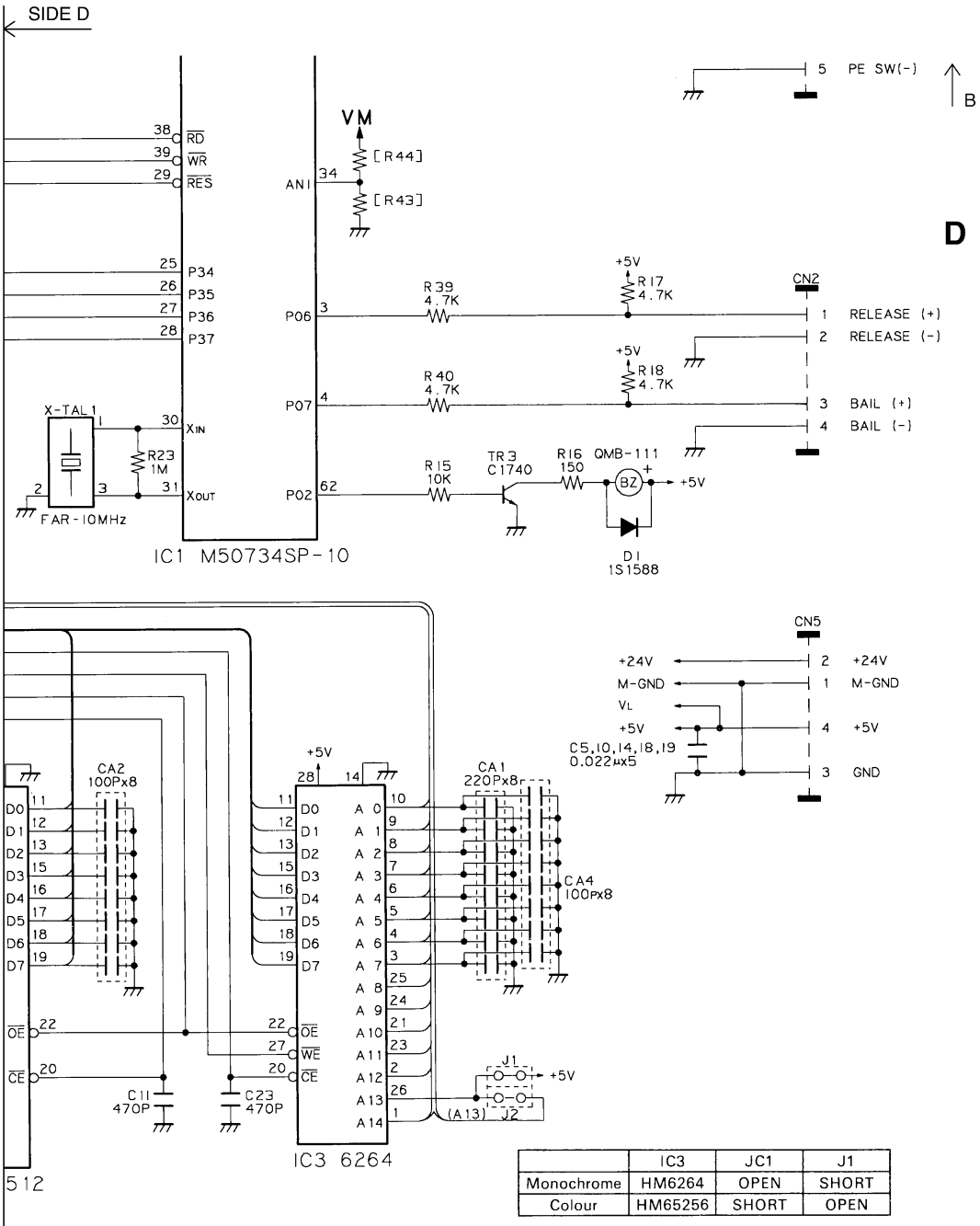
5-2-3. Circuit Diagram (Ver. 1.5)




SIDE B
B
D
R20 10K +5V
R22 10K
TR2 C1740
R21 2.2K
TR1 A933
+24V
CN8
4 HD CMN1
7 HD CMN2
11 HD CMN3
14 F-GND
13 F-GND
15 F-GND
J78
F-GND
C21 0.047μ
[C24][R28]
[ZD2]
+5V
64 Vcc
32 Vss
RA5 1Kx9
330x9 R27
D2010x9
TR13 1 HD1
R26 TR14 2 HD2
R31 TR9 12 HD3
R28 TR12 3 HD4
R30 TR10 9 HD5
R29 TR11 5 HD6
R32 TR8 10 HD7
R34 TR6 6 HD8
R33 TR7 8 HD9
M-GND
59 WDOUT
RA7 61 P01(INT 2)
DSW1
4.7Kx8
12 P17
11 P16
10 P15
9 P14
8 P13
7 P12
6 P11
5 P10
DSW2
60 P00
35 AN2
36 AN3
RA6 4.7Kx3
63 P03
1 P04
58 D0
57 D1
56 D2
55 D3
54 D4
53 D5
52 D6
51 D7
50 ALE
49 A 8
48 A 9
47 A10
46 A11
45 A12
44 A13
43 A14
42 A15
CA3 100Px8
2 P05(DME)
J50
AN0 33
VREF 37 +5V
+VL
+24V
R202 22½W
R210 10K
D201 1SR35-100
CN6
TR202 B1359
CN9 CN11
R19 4.7K
TR5 C1740
R209 10K
P30 21
R24 10K
1 CR CMN
2 CR CMN
STA401A
IKx4 R208
R206
R207
R205
TA 201
P20 13
P22 15
P21 14
P23 16
3 CR Ø1
4 CR Ø3
5 CR Ø2
6 CR Ø4
M-GND
R201 2.7 2W
R204 10K
D202 1SR35-100
CN7
TR201 B1359
TR4 C1740
R203 10K
R25 10K
P31 22
1 LF CMN
2 LF CMN
STA401A
IKx4 R211
R212
R213
R214
TA 202
P24 17
P26 19
P25 18
P27 20
3 LF Ø1
4 LF Ø3
5 LF Ø2
6 LF Ø4
CN4
R36 47K
R42 4.7K
P33 24
C22 470P
R37 150
2 HP TR(+)
3 HP TR(-)
1 HP LED(+)
4 HP LED(-)
R35 4.7K
R41 4.7K
P32 23
6 PE SW(+)
5 PE SW(-)


SIDE C
A
C
IC4 D65006CW-LCII
ROM CS
RAM CS
RD
WR
RES
220P
220P
C7
0.022μ
+5V RA1
4.7Kx4
R47 4.7K
R48 4.7K
R49 4.7K
R50 4.7K
+5V
C17
0.022μ
25V
CN10
R101 270 LED1 LT-1H11A POWER LAMP
R102 270 LED2 LT-1E21A ON LINE LAMP
R103 270 LED3 LT-1E21A PICA LAMP
R104 270 LED4 LT-1E21A ELITE LAMP
R105 270 LED5 LT-1E21A COND LAMP
R106 270 LED6 LT-1E21A PROP LAMP
R107 270 LED8 LT-1E21A SANS SERIF LAMP
R108 270 LED7 LT-1E21A COURIER LAMP
R109 270 LED9 LT-1E21A ORATOR LAMP
R110 270 LED10 LT-1H11A ITARIC LAMP
SW1 SKHHAL ON LINE SWITCH
SW2 SKHHAL PAPER FEED SWITCH
SW3 SKHHAL PRINT PITCH SWITCH
SW4 SKHHAL TYPE STYLE SWITCH
JP
TAB
RT-01N-2.3A
+5V
A0 A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 A11 A12 A13 A14 A15
D0 D1 D2 D3 D4 D5 D6 D7
OE
CE
IC2 27512
<Note 1> The unit of resis
<Note 2> The unit of capa
<Note 3> The components



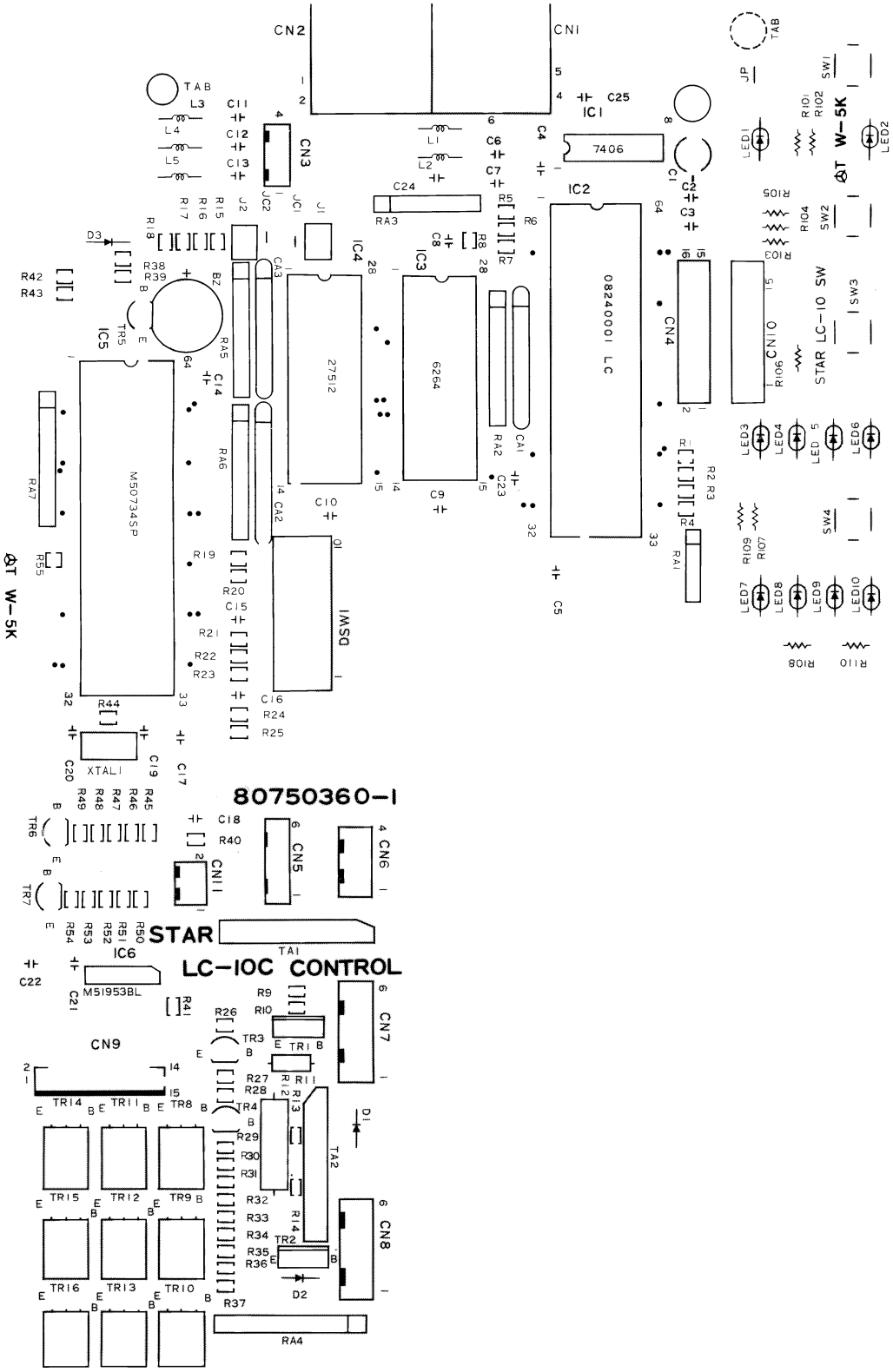
	IC3	JC1	J1
Monochrome	HM6264	OPEN	SHORT
Colour	HM65256	SHORT	OPEN

esistor and resistor array is " Ω ", and no indication of wattage means 1/6W, 1/8W respectively.
apacitor is "F", and no indication of voltage means 50V.
ts in bracket are not installed the board.

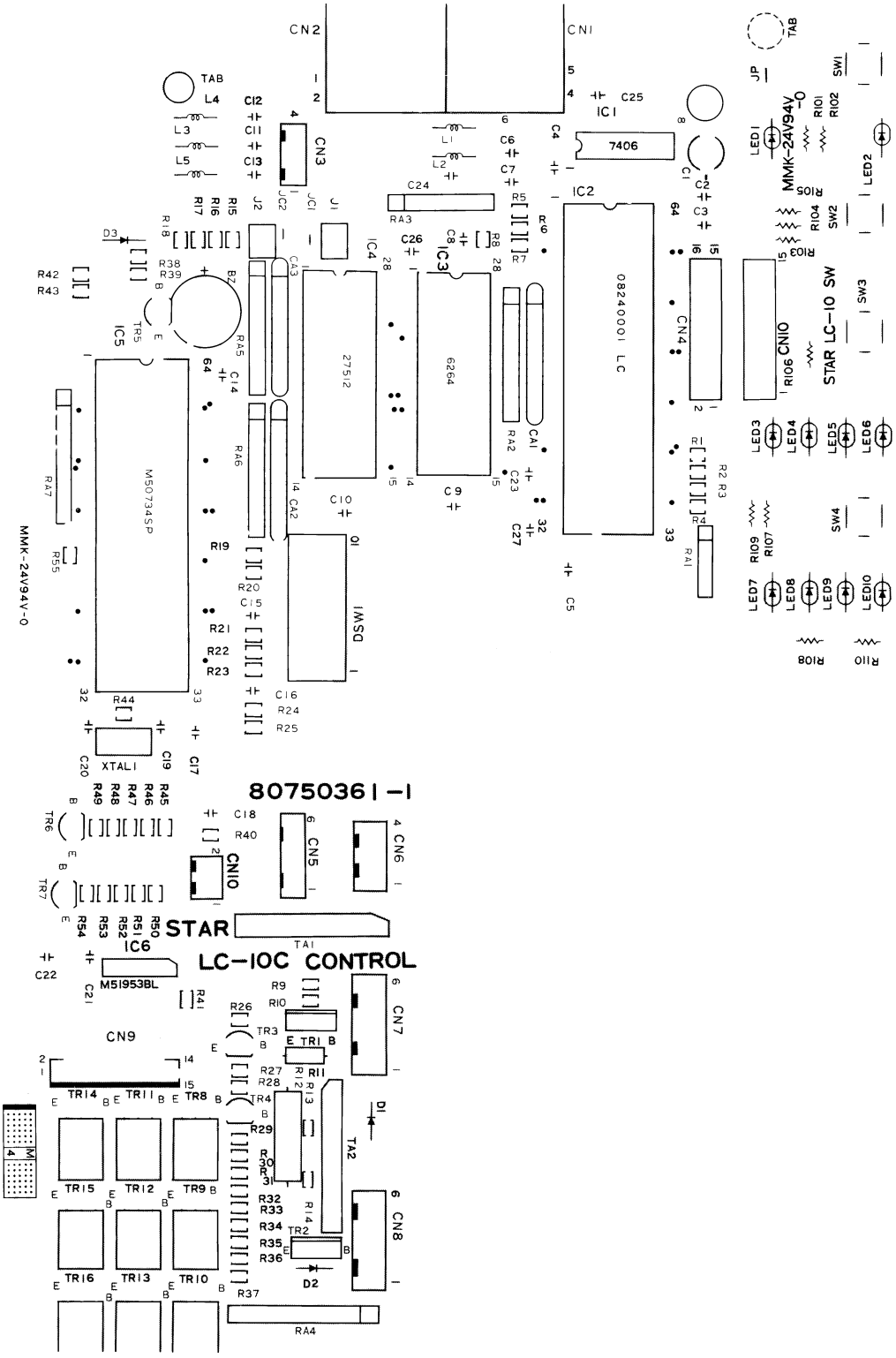
MAIN LOGIC BOARD (PARALLEL TYPE VER. 1.5)

5-3. Commodore Type

5-3-1. Component Layout (A Board)



5-3-1. Component Layout (B Board)



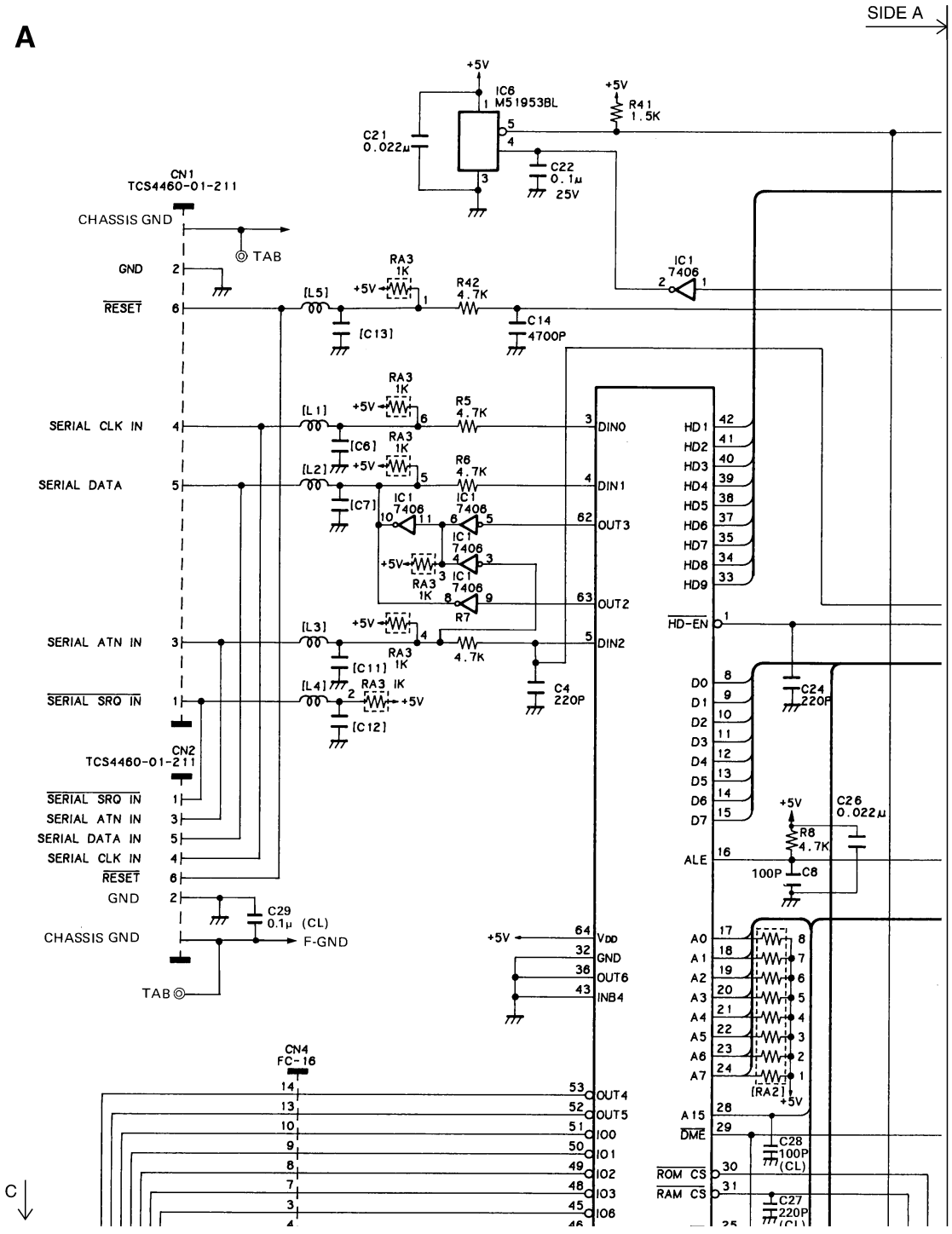
5-3-2. Parts List Main Logic Board (Commodore Type)

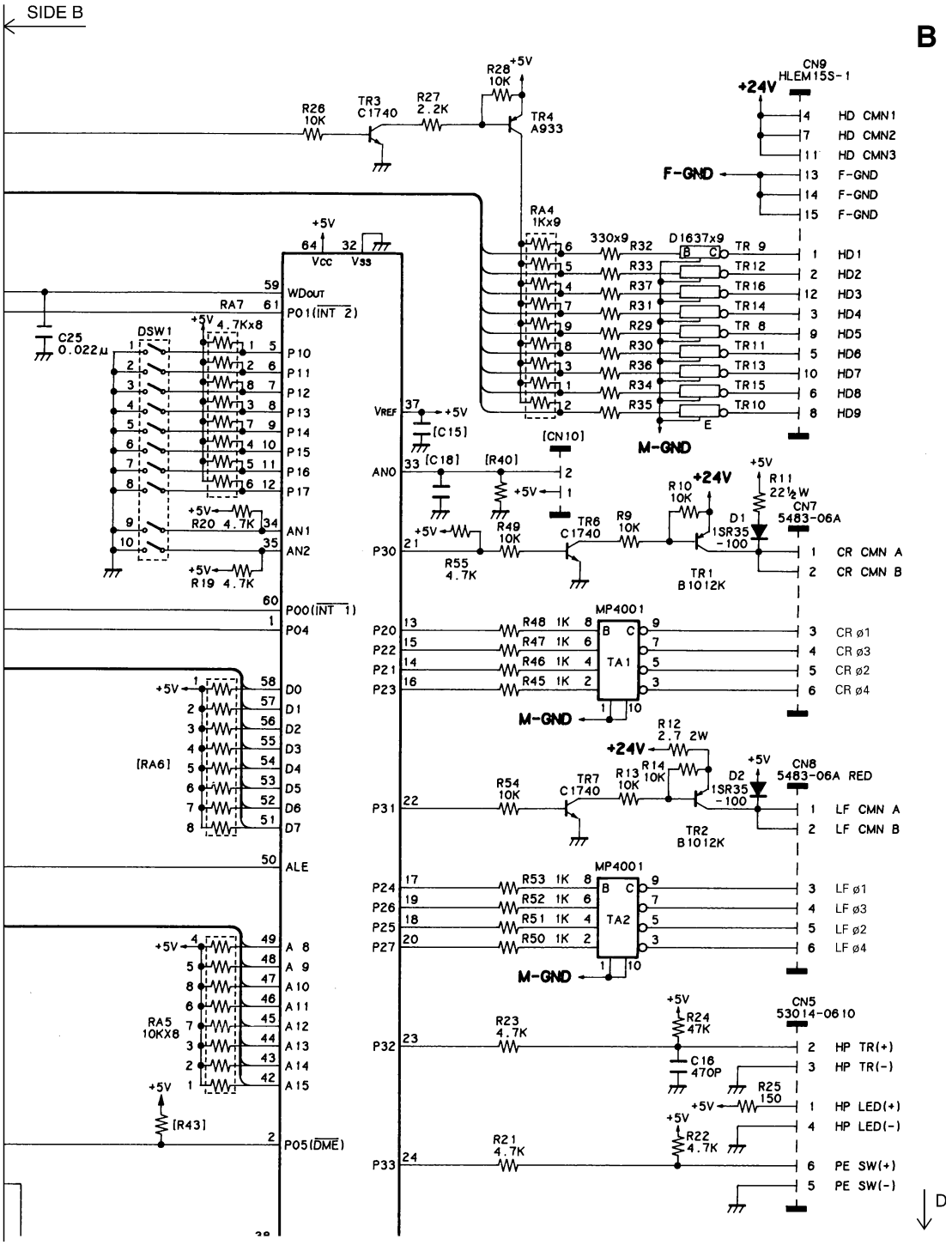
Main Logic Board (Commodore Type)

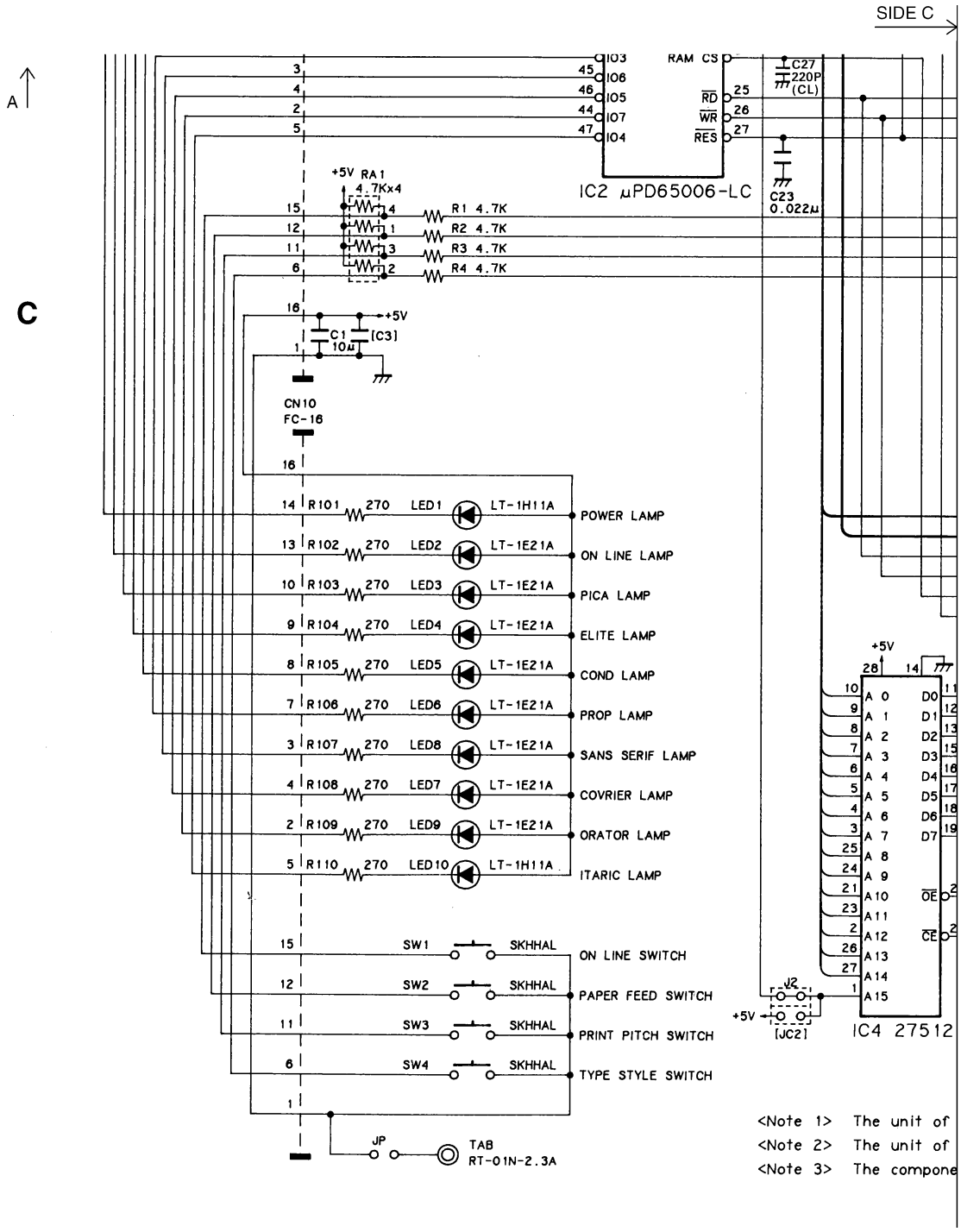
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1		08210006	TTL IC 7406	1		
IC2		08240001	GATE ARRAY D65006CW-LC	1		S
IC3		08221002	SRAM HM6264P-100NS	1	FOR MONO	S
	#1	08221007	PSRAM HM65256BLP-100NS	1	FOR CL	S
IC4		08220116	EPROM 27512-150NS	1	NX1C.** :FOR MONO	S
	#1	08220116	EPROM 27512-150NS	1	NX1C.**.CL :FOR CL	S
IC5		08250001	CPU M50734SP-10	1		S
IC6		08200109	IC-RESET M51953BL	1		S
TA1-2		07650029	TRANSISTOR ARRAY MP4001	2		S
TR1-2		07110121	TRANSISTOR 2SB1012K	2		S
TR3		07227853	TRANSISTOR 2SC1740SE	1		
TR4		07011752	TRANSISTOR 2SA1266*	1		
TR5-7		07227853	TRANSISTOR 2SC1740SE	3		
TR8-16		07316371	TRANSISTOR 2SD1637	9		S
D1-2		08000044	DIODE 1SR139-100AT	2		
D3	*8	08000039	DIODE 1S1588	1		
	#8	08000096	DIODE 1S2076A*A	1		
RA1	*2	06584721	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
	#2	06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA2					NOT MOUNTED	
RA3	*2	06581025	RESIS. ARRAY 1 K-OHM 1/8W 6EL	1		
	#2	06581027	RESIS. ARRAY 1 K-OHM 1/8W 6EL	1		
RA4	*2	06581022	RESIS. ARRAY 1 K-OHM 1/8W 9EL	2		
	#2	06581028	RESIS. ARRAY 1 K-OHM 1/8W 9EL	1		
RA5	*2	06581032	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
	#2	06581038	RESIS. ARRAY 10 K-OHM 1/8W 8EL	1		
RA6					NOT MOUNTED	
RA7	*2	06584723	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
	#2	06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
R1-8		06054725	RD RESISTOR 4.7 K-OHM 1/6W	8		
R9-10		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R11		06022206	RD RESISTOR 22 OHM 1/2W	1		
R12	*2	06200271	RN RESISTOR 2.7 OHM 2W 2%	1		
	#2	06200274	RN RESISTOR 2.7 OHM 2W 2%	1		
R13-14		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R15-23		06054725	RD RESISTOR 4.7 K-OHM 1/6W	9		
R24		06054734	RD RESISTOR 47 K-OHM 1/6W	1		
R25		06051514	RD RESISTOR 150 OHM 1/6W	1		
R26		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R27		06052224	RD RESISTOR 2.2 K-OHM 1/6W	1		
R28		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R29-37		06053314	RD RESISTOR 330 OHM 1/6W	9		
R38		06051514	RD RESISTOR 150 OHM 1/6W	1		
R39		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R40					NOT MOUNTED	
R41		06051525	RD RESISTOR 1.5 K-OHM 1/6W	1		
R42		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R43					NOT MOUNTED	
R44		06051051	RD RESISTOR 1 M-OHM 1/6W	1		
R45-48		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
R49		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R50-53		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
R54		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R55		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R101-110		06052714	RD RESISTOR 270 OHM 1/6W	10		
CA1		05651012	CAPA. ARRAY 100PF 50V 8EL	1		

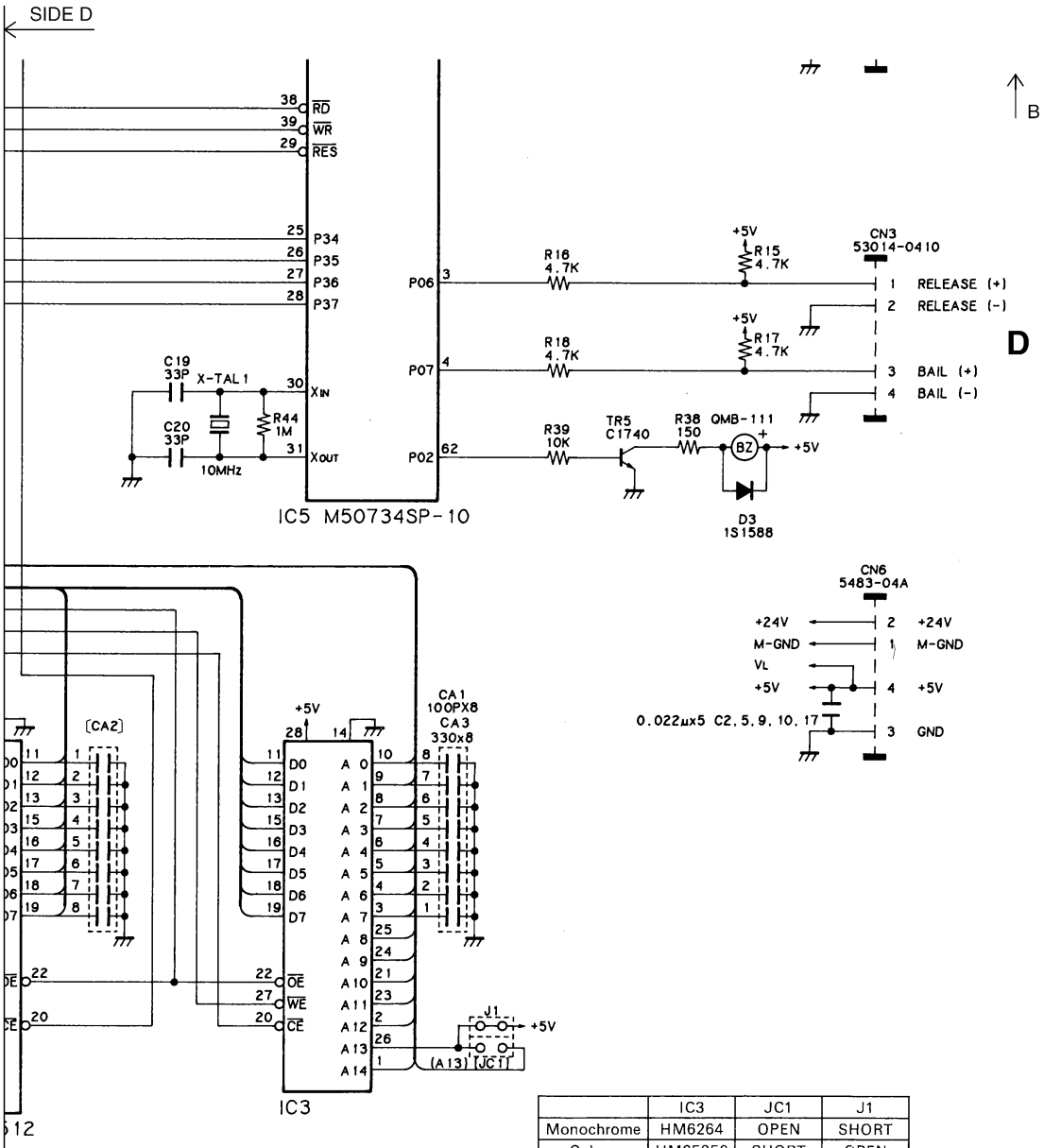
DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
CA2					NOT MOUNTED	
CA3		05653311	CAPA. ARRAY 330PF 50V 8EL	1		
C1		05051062	CHEM. CAPA. 10UF 50V	1		
C2		05152234	CERA. CAPA. 0.022UF 50V	1		
C3					NOT MOUNTED	
C4		05152212	CERA. CAPA. 220PF 50V	1		
C5		05152234	CERA. CAPA. 0.022UF 50V	1		
C6-7					NOT MOUNTED	
C8		05154714	CERA. CAPA. 470PF 50V	1		
C9-10		05152234	CERA. CAPA. 0.022UF 50V	2		
C11-13					NOT MOUNTED	
C14		05154723	CERA. CAPA. 4700PF 50V	1		
C15					NOT MOUNTED	
C16		05154714	CERA. CAPA. 470PF 50V	1		
C17		05152234	CERA. CAPA. 0.022UF 50V	1		
C18					NOT MOUNTED	
C19-20		05153303	CERA. CAPA. 33PF 50V	2		
C21		05152234	CERA. CAPA. 0.022UF 50V	1		
C22	*2	05131042	CERA. CAPA. 0.1UF 25V	1		
	#2	05551044	CAPACITOR 0.1UF 50V	1		
C23		05152234	CERA. CAPA. 0.022UF 50V	1		
C24		05152212	CERA. CAPA. 220PF 50V	1		
C25		05152234	CERA. CAPA. 0.022UF 50V	1		
C26	*3	05152231	CERA. CAPA. 0.022UF 50V	1	FOR CL ONLY	
	#3	05152234	CERA. CAPA. 0.022UF 50V	1	FOR CL ONLY	
C27	#2	05152212	CERA. CAPA. 220PF 50V	1	FOR CL ONLY	
C28	#2	05151013	CERA. CAPA. 100PF 50V	1	FOR CL ONLY	
C29	#2	05131041	CERA. CAPA. 0.1UF 25V	1	FOR CL ONLY	
L1-5					NOT MOUNTED	
XTAL1		09250032	CERA. OSCILLATOR KBR10MHZ	1		
BZ		45060201	QMB-111P	1		
DSW1	*2	09090019	DIP SWITCH KSD10	1		
	#2	09090035	DIP SWITCH KSS10-1	1		
SW1-4	*2	09010041	PUSH SWITCH SKHHAL	4		
	#2	09010043	PUSH SWITCH SKHHAL=S	4		
LED1		08300055	LED LT-1H11A	1		
LED2-9		08300058	LED LT-1E21A	8		
LED10		08300055	LED LT-1H11A	1		
JC1					NOT MOUNTED:FOR MONO	
	#1	93930006	JUMPER WIRE STP122	1	:FOR CL	
JC2					NOT MOUNTED	
CN1-2		09100246	CONNECTOR CSK-150-6P	2		
CN3	*4	09100342	CONNECTOR 53014-0410	1		
	*6	09100476	CONNECTOR 53014-0470	1		
	#6	09100342	CONNECTOR 53014-0410	1		
CN4		09100339	CONNECTOR FC-16	1		
CN5	*4	09100341	CONNECTOR 53014-0610	1		
	*6	09100474	CONNECTOR 53014-0670	1		
	#6	09100341	CONNECTOR 53014-0610	1		
CN6		09100317	CONNECTOR 5483-04A	1		
CN7		09100267	CONNECTOR 5483-06A	1		
CN8		09100278	CONNECTOR 5483-06A-RED	1		
CN9	*2	09100340	CONNECTOR HLEM15S-1	1		
	#2	09100384	CONNECTOR HLEM15S-2	1		
CN10A					NOT MOUNTED	
CN10B		09100339	CONNECTOR FC-16	1		
TAB		80700250	WIRE 18UL1007BLK055T	1		

5-3-3. Circuit Diagram




SIDE B
B
D
CN9
HLEM15S-1
+24V
HD CMN1
HD CMN2
HD CMN3
F-GND
F-GND
F-GND
R28 10K
+5V
R26 10K
TR3 C1740
R27 2.2K
TR4 A933
RA4 1Kx9
330x9
R32
D1637x9
TR 9
HD1
R33
TR12
HD2
R37
TR16
HD3
R31
TR14
HD4
R29
TR 8
HD5
R30
TR11
HD6
R36
TR13
HD7
R34
TR15
HD8
R35
TR10
HD9
M-GND
+5V
64 Vcc
32 Vss
59 WDOUT
RA7 61 P01(INT 2)
4.7Kx8
C25 0.022μ
DSW1
P10
P11
P12
P13
P14
P15
P16
P17
R20 4.7K
AN1
R19 4.7K
AN2
60 P00(INT 1)
1 P04
VREF 37
+5V
[C15]
[CN10]
AN0 33
[C18]
[R40]
2
1
+5V
R49 10K
R55 4.7K
P30 21
TR6 C1740
R9 10K
R10 10K
+24V
D1 1SR35-100
+5V
R11 22½W
CN7 5483-06A
TR1 B1012K
1 CR CMN A
2 CR CMN B
MP4001
P20 13 R48 1K
P22 15 R47 1K
P21 14 R46 1K
P23 16 R45 1K
TA1
3 CR ø1
4 CR ø3
5 CR ø2
6 CR ø4
M-GND
R12 2.7 2W
+24V
R14 10K
+5V
D2 1SR35-100
CN8 5483-06A RED
R54 10K
TR7 C1740
R13 10K
P31 22
TR2 B1012K
1 LF CMN A
2 LF CMN B
MP4001
P24 17 R53 1K
P26 19 R52 1K
P25 18 R51 1K
P27 20 R50 1K
TA2
3 LF ø1
4 LF ø3
5 LF ø2
6 LF ø4
M-GND
+5V
CN5 53014-0610
R24 47K
R23 4.7K
P32 23
C16 470P
R25 150
2 HP TR(+)
3 HP TR(-)
1 HP LED(+)
4 HP LED(-)
+5V
R22 4.7K
R21 4.7K
P33 24
6 PE SW(+)
5 PE SW(-)
[RA6]
D0
D1
D2
D3
D4
D5
D6
D7
ALE
RA5 10KX8
A 8
A 9
A10
A11
A12
A13
A14
A15
[R43]
P05(DME)


SIDE C
A
C
IC2 μPD65006-LC
RAM CS
C27 220P (CL)
C23 0.022μ
+5V RA1 4.7Kx4
R1 4.7K
R2 4.7K
R3 4.7K
R4 4.7K
C1 10μ [C3]
CN10 FC-16
POWER LAMP
ON LINE LAMP
PICA LAMP
ELITE LAMP
COND LAMP
PROP LAMP
SANS SERIF LAMP
COVRIER LAMP
ORATOR LAMP
ITARIC LAMP
ON LINE SWITCH
PAPER FEED SWITCH
PRINT PITCH SWITCH
TYPE STYLE SWITCH
JP
TAB RT-01N-2.3A
[JC2]
IC4 27512
<Note 1> The unit of
<Note 2> The unit of
<Note 3> The compone



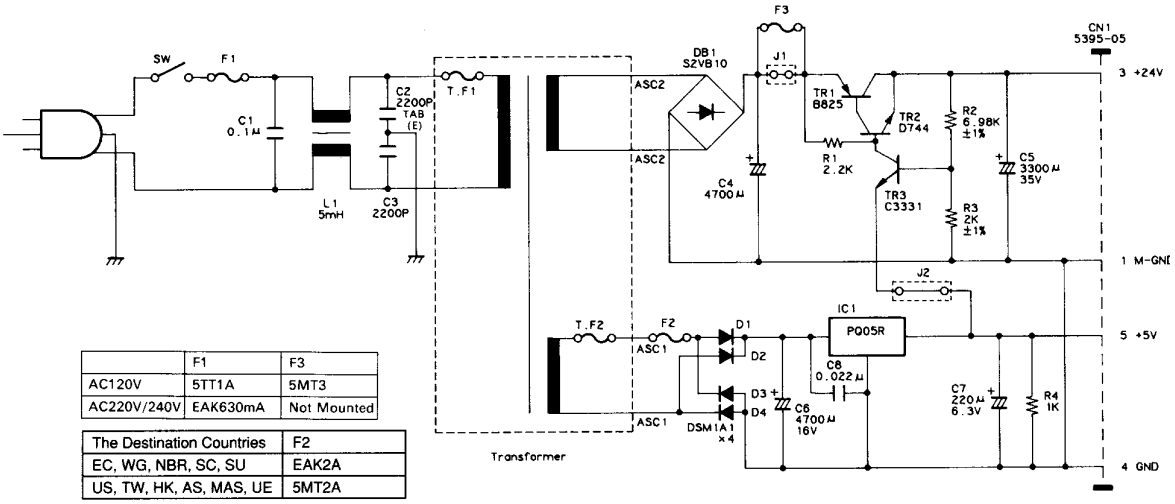
	IC3	JC1	J1
Monochrome	HM6264	OPEN	SHORT
Colour	HM65256	SHORT	OPEN

of resistor and resistor array is " Ω ", and no indication of wattage means 1/6W, 1/8W respectively.
of capacitor is "F", and no indication of voltage means 50V.
ponents in bracket are not installed the board.

MAIN LOGIC BOARD (COMMODORE TYPE)

6. Power Supply Unit (Ver. 1 and 1.5)

6-1. Circuit Diagram



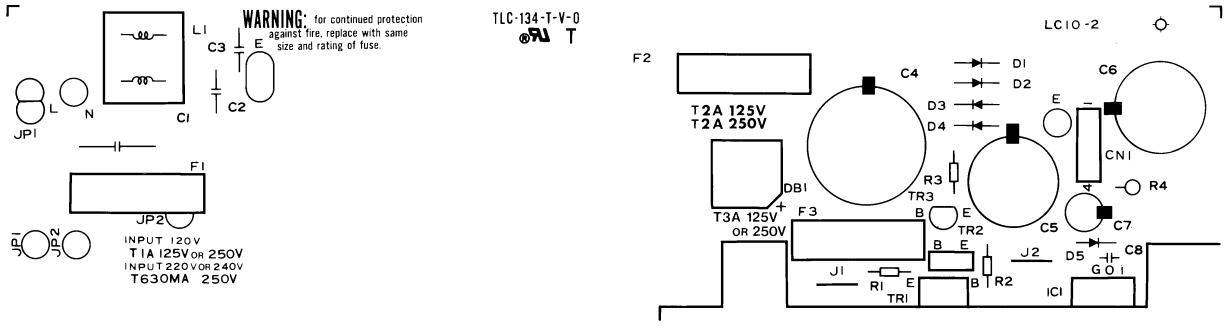
	F1	F3
AC120V	5TT1A	5MT3
AC220V/240V	EAK630mA	Not Mounted

The Destination Countries	F2
EC, WG, NBR, SC, SU	EAK2A
US, TW, HK, AS, MAS, UE	5MT2A

<Note 1> The unit of resistor and resistor array is "Ω", and no indication of wattage means 1/4W respectively.
<Note 2> The unit of capacitor is "F", and no indication of voltage means 50v.
<Note 3> The "T·F2" mark is for 120V only.

POWER SUPPLY UNIT

6-2. Component Layout



6-3. Parts List

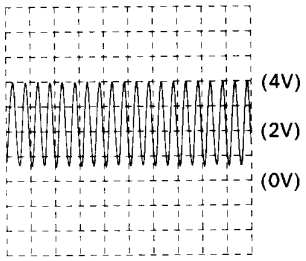
Power Supply Unit (Ver. 1 and 1.5)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1	*5	08202003	IC-REG PQ05RO41	1		
	#5	08202024	IC-REG PQ05RF11	1		
TR1	*2	07108251	TRANSISTOR 2SB825	1		
	#2	07111351	TRANSISTOR 2SB1135RS	1		
TR2		07307741	TRANSISTOR 2SD774	1		
TR3		07233312	TRANSISTOR 2SC3331ST	1		
D1-4		08000040	DIODE DSM1D1	4		
DB1		08990207	DIODE STACK S2VB10	1		
R1	*2	06022224	RD RESISTOR 2.2 K-OHM 1/2W	1		
	#2	06041022	RD RESISTOR 1 K-OHM 1/4W	1		
R2		06246921	RN RESISTOR 6980 OHM 1/4W 1%	1		
R3		06242021	RN RESISTOR 2 K-OHM 1/4W 1%	1		
R4		06041022	RD RESISTOR 1 K-OHM 1/4W	1		
C1		05291042	FILM CAPA. 0.1UF 250V	1		
C2-3	*2	05192221	CERA. CAPA. 2200PF 400V	2		
	#2	05192224	CERA. CAPA. 2200PF 400V	2	FOR SC	
					NOT MOUNTED :FOR HK	
	*3	05192223	CERA. CAPA. 2200PF 400V	2	EXCEPT FOR SC,HK	
	#3	05192224	CERA. CAPA. 2200PF 400V	2	EXCEPT FOR SC,HK	
C4		05054781	CHEM. CAPA. 4700UF 50V	1		
C5		05043384	CHEM. CAPA. 3300UF 35V	1		
C6		05024781	CHEM. CAPA. 4700UF 16V	1		
C7		05002213	CHEM. CAPA. 220UF 6.3V	1		
C8		05152231	CERA. CAPA. 0.022UF 50V	1		
F1		09990058	FUSE 5TT1A 250V	1	FOR 120V	S
		09990021	FUSE EAWK630MA 250V	1	FOR 220V/240V	S
F2		09990026	FUSE 5MT2A 125V	1	EXCEPT FOR BELOW	S
		09990048	FUSE EAK2A 250V	1	FOR EC,WG,NBR.SC,SU	S
F3		09990025	FUSE 5MT3A 125V	1	FOR 120V ONLY	S
J1		93930006	JUMPER WIRE STP122	1	EXCEPT FOR 120V	
L1		09251106	LINE FILTER SU10V-05050	1		
SW		09030010	SEESAW SWITCH WK2A44	1		
-		09240240	TRANSFORMER 120V LC-10SWD US	1	FOR 120V	
	#1	09240250	TRANSFORMER 220V LC-10-T EC	1	FOR 220V	
	*1	09240280	TRANSFORMER 220V LC-10-P HK	1	FOR HK	
	*1	09240270	TRANSFORMER 240V LC-10-P AS	1	FOR AS	
	#1	09240260	TRANSFORMER 240V LC-10SWD UK	1	FOR 240V	

7. Waveform with Oscilloscope

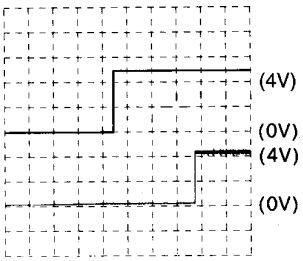
Non : For parallel type (Ver. 1)
( ) : For parallel type (Ver. 1.5)
[ ] : For commodore type

(1) Crystal (10 MHz)



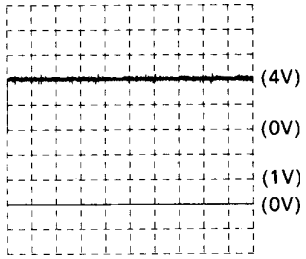
Crystal Pin 30 of IC5
(Pin 30 of IC1)
[Pin 30 of IC5]
Time/Div : 0.2 µs
Volt/Div : 1V

(2) $\overline{\text{RESET}}$ (Power on reset)



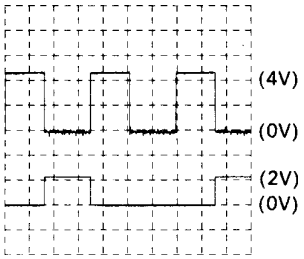
Upper : RESET input Pin 4 of IC6
(Pin 4 of IC6)
[Pin 4 of IC6]
Lower : RESET output Pin 5 of IC6
(Pin 5 of IC6)
[Pin 5 of IC6]
Time/Div : 10 ms
Volt/Div : 2V

(3) Protection Circuit



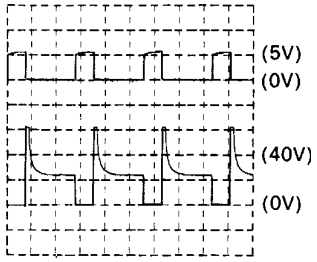
Upper : $\overline{\text{RESET}}$ Pin 5 of IC6
(Pin 5 of IC6)
[Pin 5 of IC6]
Lower : WD OUT Pin 59 of IC5
(Pin 59 of IC1)
[Pin 59 of IC5]
Time/Div : 5 ms
Volt/Div : Upper 2V
Lower 1V

(4) Head Energizing Control Signal



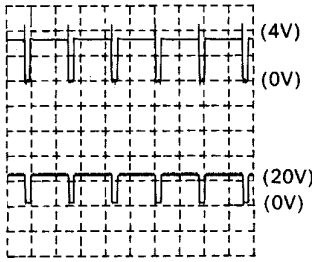
Upper : $\overline{\text{HD-EN}}$ Pin 1 of IC1
(Pin 57 of IC4)
[Pin 1 of IC2]
Lower : HD1 Data Pin 42 of IC1
(Pin 40 of IC4)
[Pin 42 of IC2]
Time/Div : 0.2 ms
Volt/Div : 2V

(5) Print Head Control Signal and Waveform



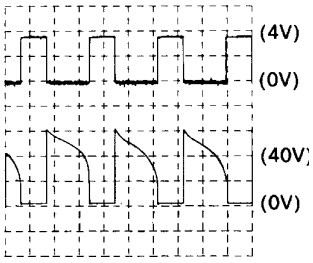
Upper : HD1 Data Pin 42 of IC1
(Pin 40 of IC4)
[Pin 42 of IC2]
Lower : HD 1 Pin 1 of CN8
(Pin 1 of CN8)
[Pin 1 of CN9]
Time/Div : 0.5 ms
Volt/Div : Upper 5V
Lower 20V

(6) Carriage Motor Common Control Signal and Diving Signal



Upper : CR-CMN Control Signal Pin 21 of IC5
(Pin 21 of IC1)
[Pin 21 of IC5]
Lower : CR-CMN Driving Signal Pin 1 of CN6
(Pin 1 of CN6)
[Pin 1 of CN7]
Time/Div : 0.5 ms
Volt/Div : Upper 2V
Lower 20V

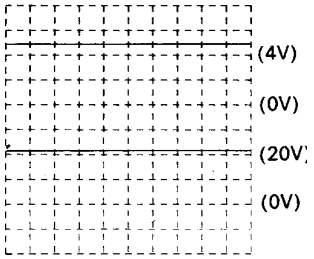
(7) Carriage Motor Control Signal and Driving Signal



Upper : Carriage-ø1 Control Signal Pin 13 of IC5
(Pin 13 of IC1)
[Pin 13 of IC5]
Lower : Carriage-ø1 Driving Signal Pin 3 of CN6
(Pin 3 of CN6)
[Pin 3 of CN7]

Time/Div : 2 ms
Volt/Div : Upper 2V
Lower 20V

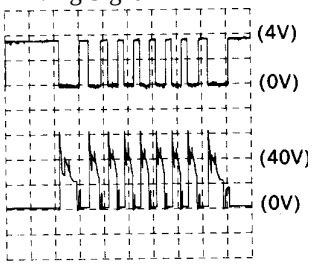
(8) Paper Feed Motor Common Control Signal and Driving Signal



Upper : LF-CMN Control Signal Pin 22 of IC5
(Pin 22 of IC1)
[Pin 22 of IC5]
Lower : LF-CMN Driving Signal Pin 1 of CN7
(Pin 1 of CN7)
[Pin 1 of CN8]

Time/Div : 20 ms
Volt/Div : Upper 2V
Lower 10V

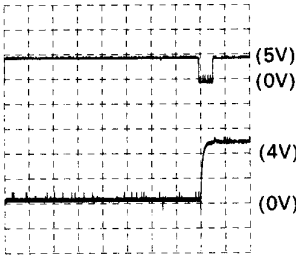
(9) Paper Feed Motor Control Signal and Driving Signal



Upper : LF-ø1 Control Signal Pin 17 of IC5
(Pin 17 of IC1)
[Pin 17 of IC5]
Lower : LF-ø1 Driving Signal Pin 3 of CN7
(Pin 3 of CN7)
[Pin 3 of CN8]

Time/Div : 50 ms
Volt/Div : Upper 2V
Lower 20V

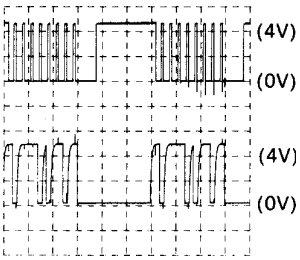
(10) Parallel Interface (parallel type Only)



Upper : $\overline{\text{STB}}$ Pin 1 of CN1
(Pin 1 of CN1)
Lower : BUSY Pin 11 of CN1
(Pin 21 of CN1)

Time/Div : 50 ms
Volt/Div : Upper 5V
Lower 2V

(11) Commandore Interface (commandore type)



Upper : SERIAL CLK [Pin 4 of CN1]
Lower : SERIAL DATA [Pin 5 of CN1]

Time/Div : 0.2 ms
Volt/Div : 2V

CHAPTER 8
PARTS LIST (Ver.2)

HOW TO USE PARTS LIST

(1) DRWG. NO.
This column shows the drawing number of the illustration.

(2) REVISED EDITION MARK
This column shows a revision number.
Part that have been added in the revised edition are indicated with "#".
Part that have been abolished in the revised edition are indicated with "*". For example,
#1 :First edition→Second edition *1 :First edition→Second edition

(3) PARTS NO.
Parts numbers must be indicated when ordering replacement parts.

(4) PARTS NAME
Parts names must be indicated when ordering replacement parts.

(5) Q'TY
This column shows the number of the part used as indicated in the figure.

(6) REMARKS
When there are differences in the specifications of the fuse, destinations, etc., the differences are described in words or indicated by two letters.

US .....U.S.A.	UE ..... EC (120V)	HK ..... Hong Kong
MAS .....Mass Merchant (NX MALTI TYPE)	EC ..... EC (220V)	UK ..... United Kingdom
	WG ..... Germany	AS ..... Australia
TW .....Taiwan	SC ..... Scandinavia	NBR ..... No Brand
SU .....Russia		

The seal number of ROM is described in this column. The "**" mark of a seal number is variable depending on the software version.

(7) RANK
Parts marked "S" are service parts. Service parts are recommendable for maintenance.

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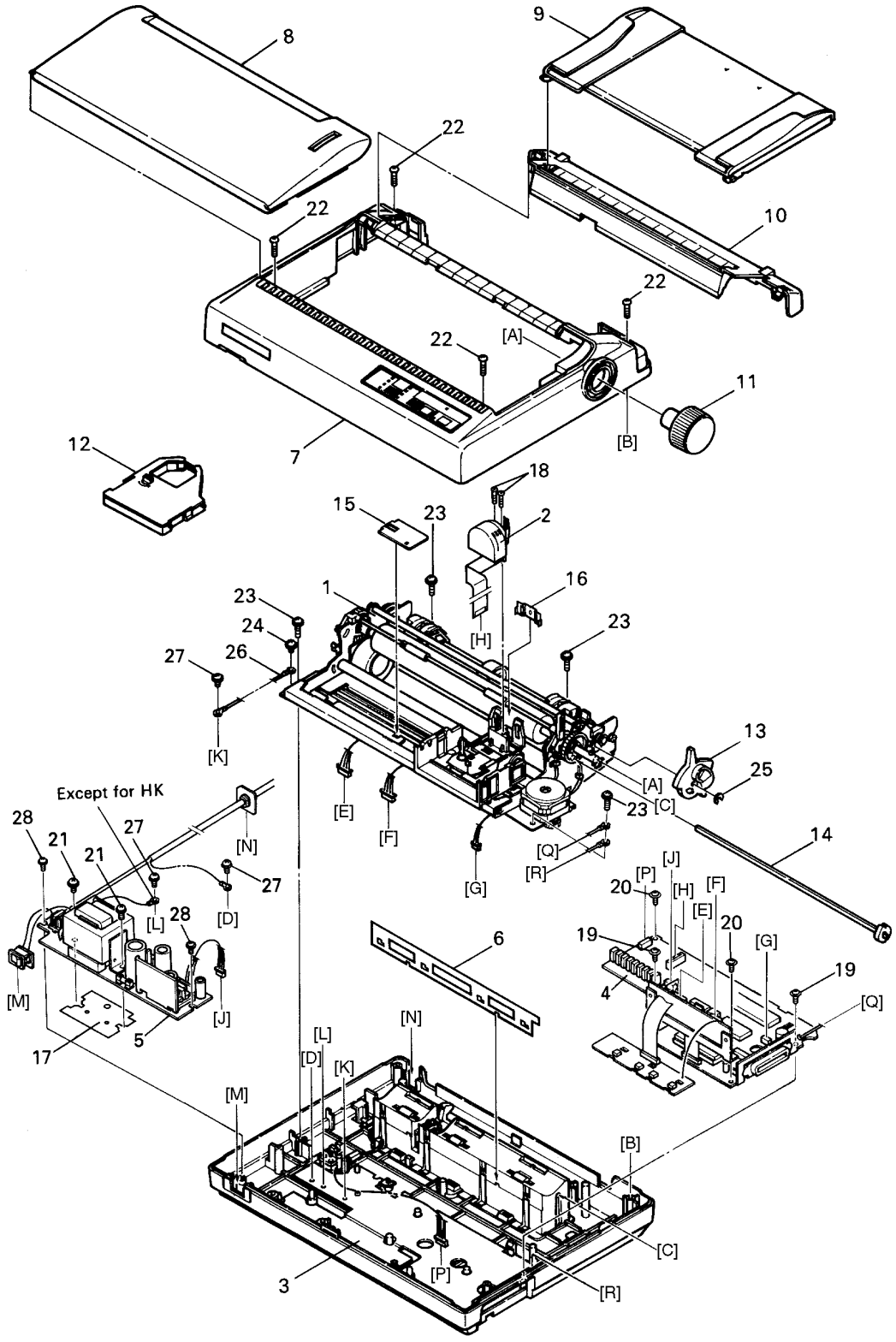
1. Printer Assembly

1-1. Disassembly Drawing



1-2. Parts List Printer Assembly (Ver .2)

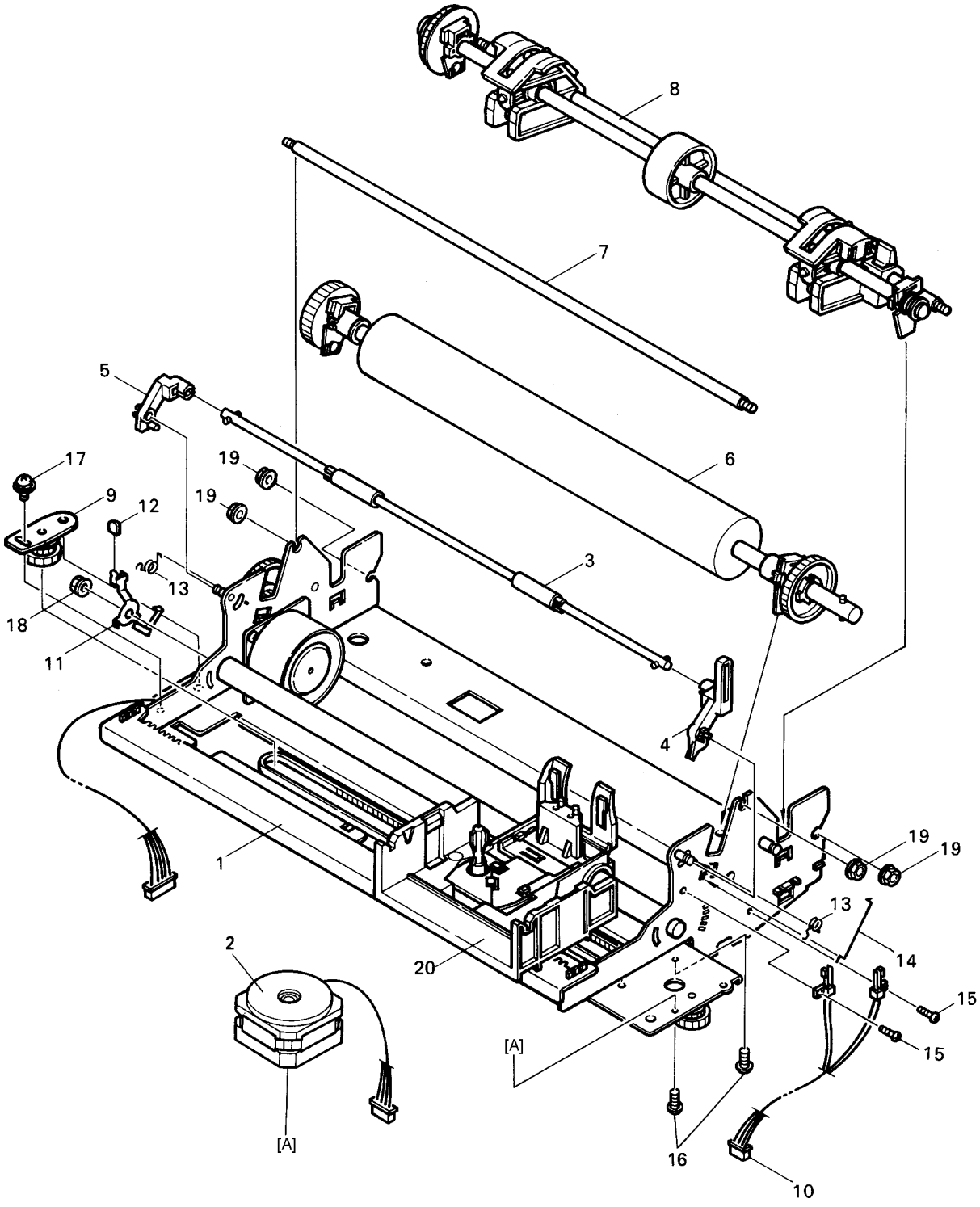
Printer Assembly (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
1		89060040	PRINTER MECHANISM DP891B	1		S
2		89130020	PRINT HEAD DP8901B	1	EXCEPT FOR EC,UE	S
		89130030	PRINT HEAD DP8901C	1	FOR EC,UE	S
3		87291050	LOWER CASE UNIT NX-1000D	1	EXCEPT FOR SC	S
		87291160	LOWER CASE UNIT LC-10II SC	1	FOR SC	S
4		87292060	MAIN LOGIC BOARD UNIT NX1000II	1	EXCEPT FOR HK	S
		87292120	MAIN LOGIC BD UNIT NX-1000IIHK	1	FOR HK	S
5		87293130	POWER SUPPLY UNIT NX-1000II US	1	FOR US,UE,TW,MAS	S
		87293140	POWER SUPPLY UNIT NX-1000II EC	1	FOR EC,WG,SC,SU,NBR	S
		87293150	POWER SUPPLY UNIT NX-1000II UK	1	FOR UK	S
		87293160	POWER SUPPLY UNIT NX-1000II AS	1	FOR AS	S
		87293170	POWER SUPPLY UNIT NX-1000II HK	1	FOR HK	S
6		82040070	SUB-GUIDE 891	1		S
7		87290150	UPPER CASE UNIT NX-1000II	1	EXCEPT FOR SU,MAS	S
	#4	87290380	UPPER CASE UNIT NX-1000II SU	1	FOR SU :NX-1000II	S
		87290290	UPPER CASE UNIT NX-1000II MAS	1	FOR MAS :NX-1000II	S
		87290240	UPPER CASE UNIT LC-10II	1	EXCEPT NBR :LC-10II	S
		87290080	UPPER CASE UNIT LC-10NBR	1	FOR NBR :LC-10II	S
8		83022890	PRINTER COVER NX-1000	1		S
9	*6	87296011	PAPER GUIDE UNIT NX-1000	1		S
	#6	87296010	PAPER GUIDE UNIT ZL-10	1		
10	*6	83022900	REAR COVER NX-1000	1		S
	#6	83022901	REAR COVER NX-1000	1		S
11	*6	83120460	PLATEN KNOB NX-1000	1		S
	#6	83903910	PLATEN KNOB QA-10	1		S
12	*7	80981160	INK RIBBON CARTRIDGE JA NX1000	1	EXCEPT US,NBR	S
	#7	80982290	INK RIBBON CARTRIDGE JAN LC9	1	EXCEPT US,NBR	S
	*7	80981560	INK RIBBON CARTRIDGE UP NX1000	1	FOR US	S
	#7	80980850	INK RIBBON CARTRIDGE UPC LC9	1	FOR US	S
	*7	80980800	INK RIBBON CARTRIDGE NX1000NBR	1	FOR NBR	S
	#7	80982360	INK RIBBON CARTRIDGE WHT LC9CL	1	FOR NBR	S
13		83400450	RELEASE LEVER 891	1		S
14		87295020	RELEASE SHAFT UNIT NX-1000	1		S
15	*4	83910840	CABLE HOLDER 891	1		S
	#4	83910841	CABLE HOLDER 941	1		S
16	*4	82900772	RIBBON HOLDER 891	1		S
	#4	82900773	RIBBON HOLDER 891	1		S
17		80991760	INSULATION SHEET NX-1000	1		S
18		01902612	SCREW TAT 2.6-16 PT	2		S
19		01903060	SCREW TAT 3-8 PT-FL	2		S
20		01903070	SCREW TR 3-8 WF	2		S
21		01914007	SCREW TR 4-8 WB	2	EXCEPT FOR US,MAS	S
		01704103	SCREW TRHT 4-10-C	2	FOR US,MAS	S
22		01914030	SCREW TAT 4-15 PT	4		S
23		01914031	SCREW TAT 4-12 PT-FL	4		S
24	*4	01914032	SCREW TAT 4-7 CT	1		S
	*5	01914039	SCREW TAT 4-8 WS	1		S
	#5	01914034	SCREW TAT 4-8 CT-WF	1		S
25		04020016	STOP RING SE4.0	1		S
26		80924911	WIRE 18UL1007BLK100TT	1		S
27		01914014	SCREW TR 4-5 WB	3	FOR US	S
	*4	01914014	SCREW TR 4-5 WB	2	FOR HK	S
	#4	01914036	SCREW TR 4-5 WS	2	FOR HK	S
	#4	01914036	SCREW TR 4-5 WS	3	EXCEPT FOR US,HK	S
28		01903071	SCREW TATH 3-10C1P	2	FOR US,MAS	S
		01903060	SCREW TAT 3-8 PT-FL	2	EXCEPT FOR US,MAS	S

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
-		89590090	ASF SF-10DJ UK	1	FOR UK,EC,SC,TW :OP.	
		89590093	ASF SF-10DJ US	1	FOR US :OPTION	
		89590091	ASF SF-10DJ WG	1	FOR WG :OPTION	
	#4	89590096	ASF SF-10DJ HK	1	FOR SU,HK :OPTION	
	#5	89590095	ASF SF-10DJ AS	1	FOR AS :OPTION	

2. Printer Mechanism

2-1. Disassembly Drawing



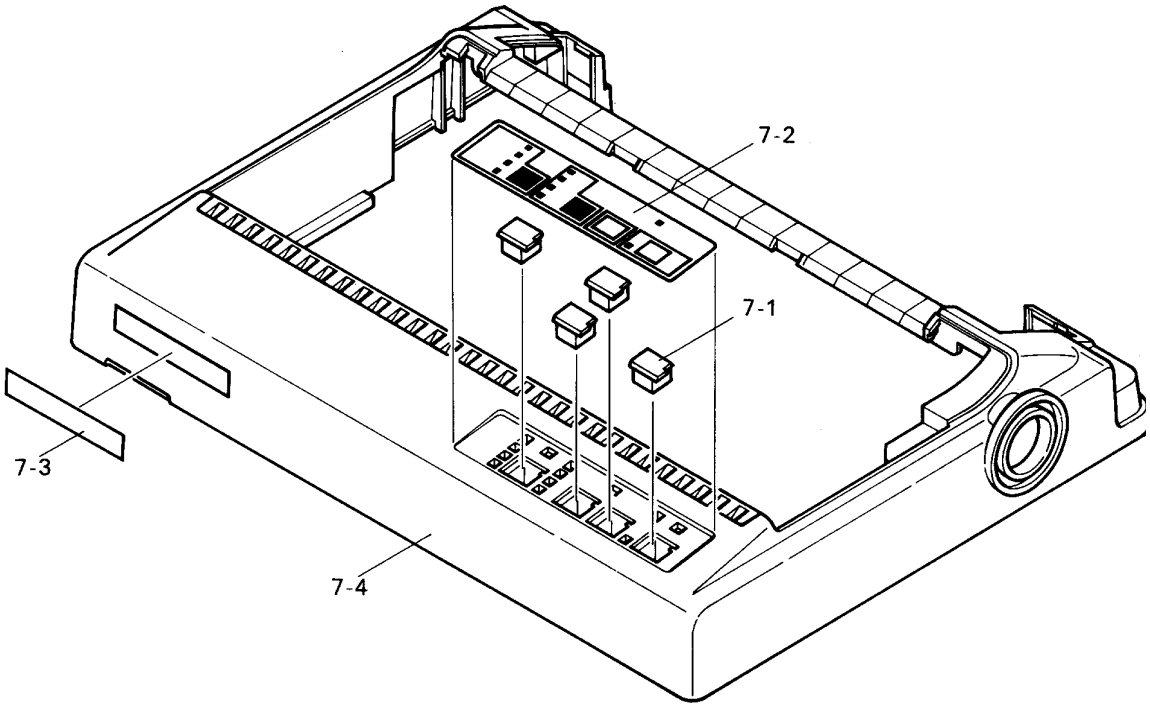
2-2. Parts List

Printer Mechanism (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1		87060011	FRAME UNIT	891B	1	WITH NO.20	
2		87061011	CARRIAGE MOTOR UNIT	891B	1		S
3		87067020	BAIL ROLLER SHAFT UNIT	891	1		
4		83400440	BAIL LEVER R	891	1		S
5		83400460	BAIL LEVER L	891	1		S
6		87063050	PLATEN UNIT	891B	1		S
7	*5	81370521	TRACTOR STAY	891	1		
	#5	81370522	TRACTOR STAY	891	1		
8		87066010	TRACTOR UNIT	891	1		S
9		87067010	TENSION LEVER UNIT	891	1		
10		87065010	DETECTOR UNIT	891	1		S
11		82400960	ADJUSTING LEVER	891	1		
12		04991229	VINYL CAP D2X5		1		
13		80530510	BAIL LEVER SPRING	891	2		S
14	*4	80530570	GROUND CONTACT SPRING	921	1		S
	#4	80530571	GROUND CONTACT SPRING	921	1		S
15	*4	00920503	SCREW TAT 2-5 CT		2		S
	#4	00926603	SCREW TAT 2.6-6 CT		2		S
16		00630504	SCREW TR 3-5		2		S
17		01903018	SCREW TR 3-6 WS/WF		1		S
18		02040404	FLANGED NUT NHW4.0-S		1		S
19	*5	02040403	TOOTHED NUT NHK4		4		S
	#5	02020401	HEXAGON NUT NH4-2		4		S
20	#4	87060341	CARRIAGE ASSY	891B	1		
-		04991204	FASTENER T18S		2		S
		04991230	MINI CORD CLAMP UAMS-05-SN		4		S

3. Sub-assembly

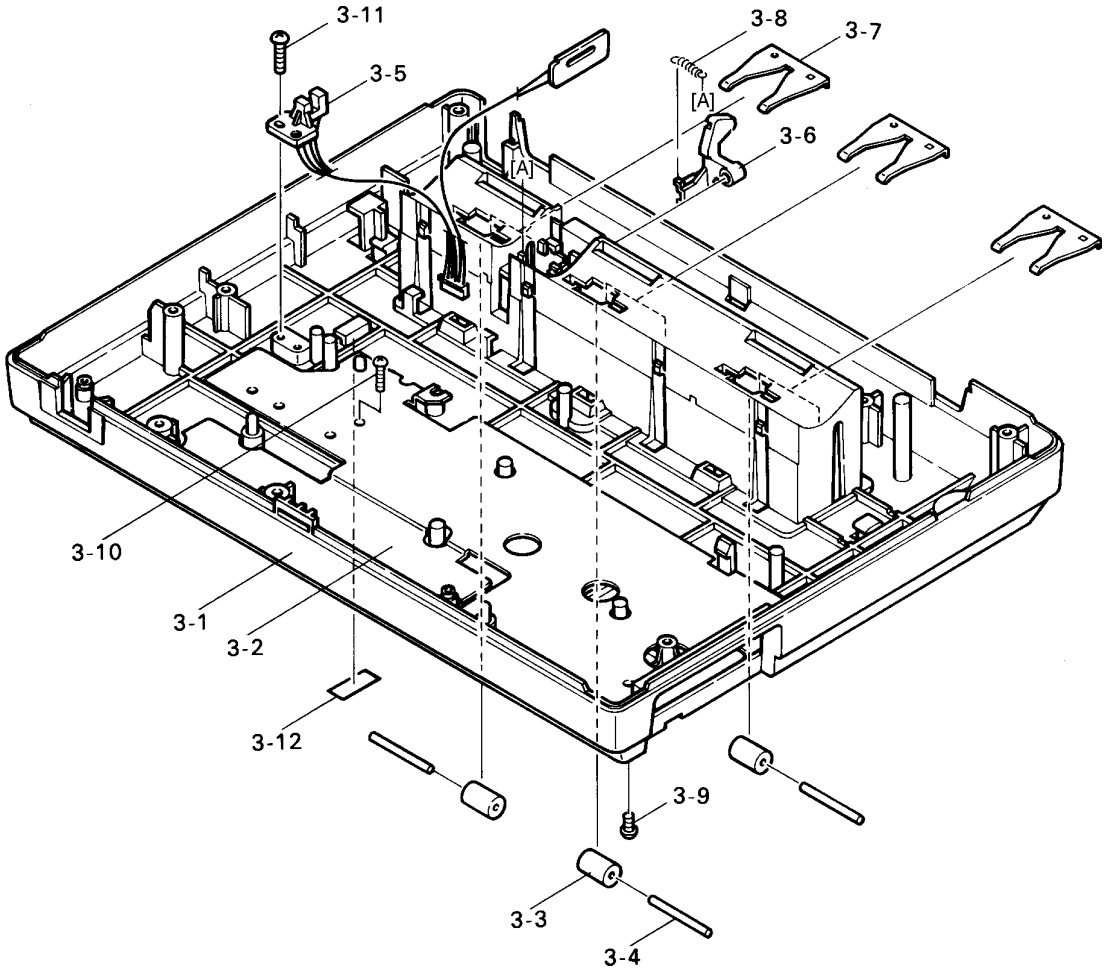
3-1. Lower Case Unit



Upper Case Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
7-1		83901660	SWITCH ACTUATOR NX-1000	4		S
7-2		80086100	OPERATION SHEET NX-1000II	1	FOR NX-1000II	S
		80085780	OPERATION SHEET NX-1000	1	FOR LC-10II	S
	#4	80086010	OPERATION SHEET SPECIAL LC-10	1	FOR SU	
7-3		80081690	BRAND SEAL NX-1000II	1	EXCEPT MAS:NX-1000II	S
		80082420	BRAND SEAL NX-1000II MAS	1	FOR MAS :NX-1000II	S
		80082370	BRAND SEAL LC-10II	1	EXCEPT NBR: LC-10II	S
					NOT MOUNTED :FOR NBR	
7-4	*6	83022880	UPPER CASE NX-1000	1		
	#6	83022881	UPPER CASE NX-1000	1		

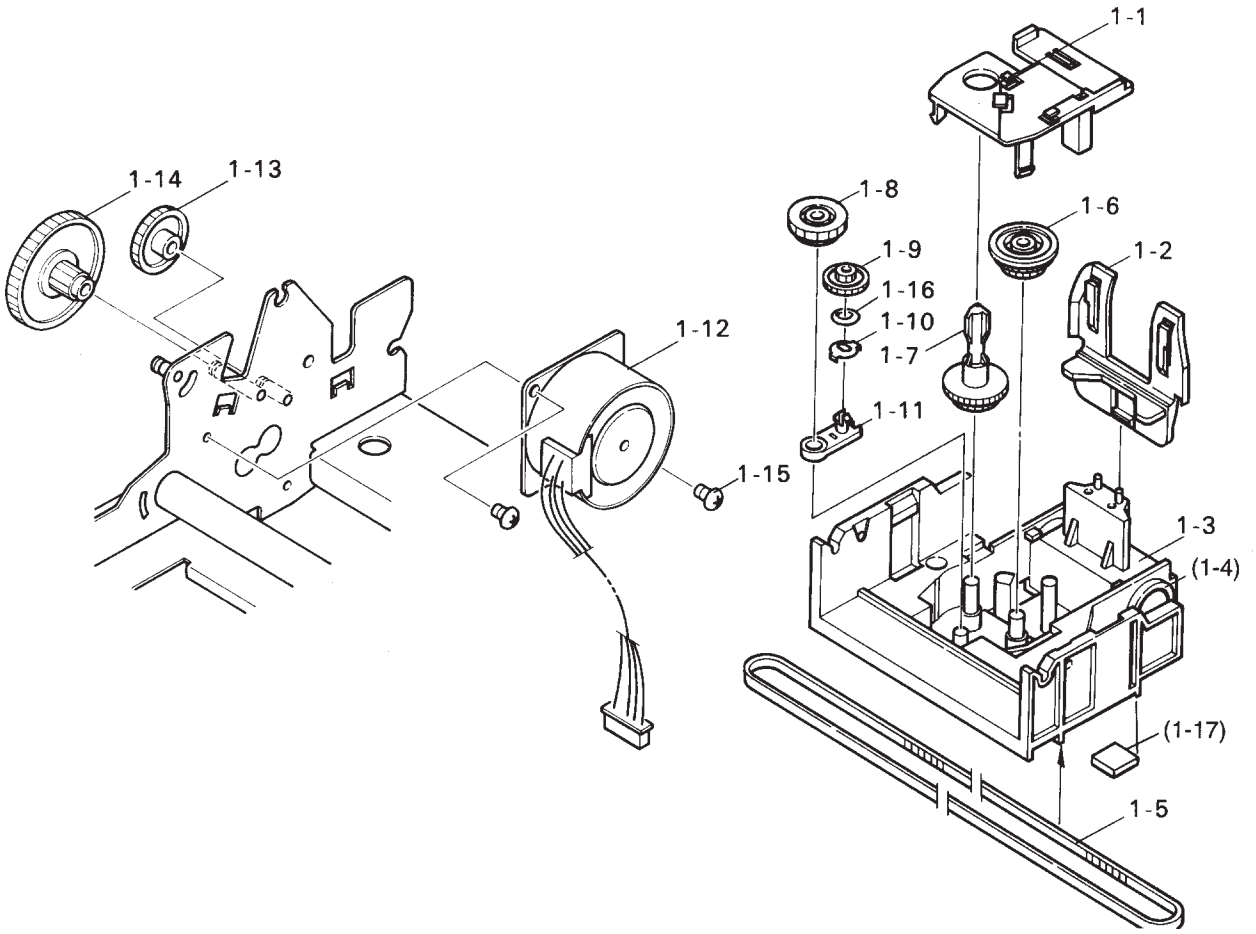
3-2. Lower Case Unit



Upper Case Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
3-1	*6	83022910	LOWER CASE NX-1000	1		
	#6	83022911	LOWER CASE NX-1000	1		
3-2		82010761	LOWER CASE CHASSIS NX-1000	1		
3-3		83200640	HOLDER ROLLER 891	3		S
3-4		81301320	ROLLER SHAFT 891	3		S
3-5		87291330	DETECTOR UNIT A NX-1000D	1		S
3-6		87291310	PE DETECTOR LEVER ASSY NX-1000	1		
3-7		82500810	RELEASE SPRING 891	3		S
3-8		80510700	SPRING E030-014-0088	1		S
3-9	*5	01903064	SCREW TAT 3-5 CT	1		S
	#5	01903094	SCREW TAT 3-5 DT	1		S
3-10		00930803	SCREW TAT 3-8 PT	3		S
3-11		01903047	SCREW TAT 3-12 PT-FL	1		S
3-12		80991800	BLIND SHEET NX-1000	1		
-		80700500	WIRE 18UL1007BLK080TS	1		
		80086480	CAUTION SEAL LC-10II SC	1	FOR SC ONLY	

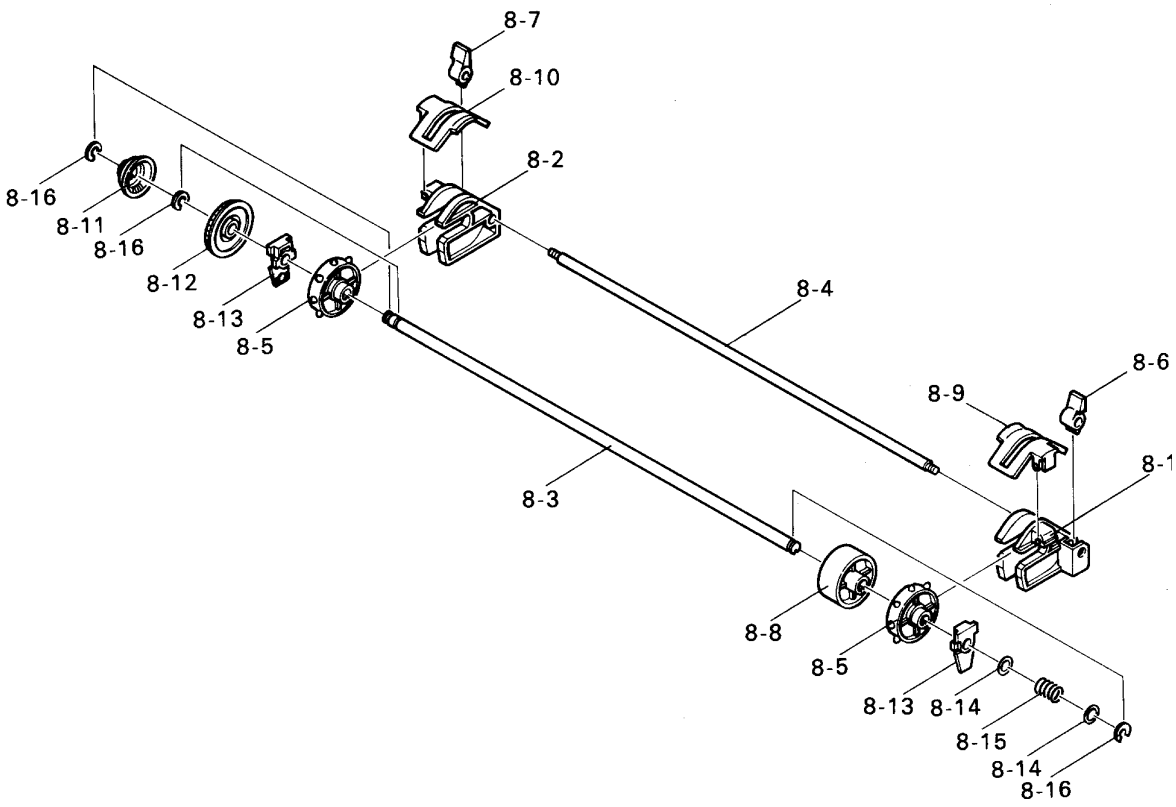
3-3. Frame Unit



Frame Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
1-1		83910853	GEAR COVER	891	1		S
1-2	*4	83901612	CARD HOLDER	891	1		S
	#4	83901614	CARD HOLDER	891	1		S
1-3	*5	83901651	CARRIAGE	891	1	WITHOUT NO.1-4	
	#5	87422320	CARRIAGE ASSY	711	1	WITH NO.1-4	
1-4	*5	80210480	BUSHING 12X14X10	891B	2		
1-5		80902050	TIMING BELT HTD102 364X3.2		1		
1-6		83100490	IDLER GEAR 43X63X0.3		1		S
1-7		83120450	RIBBON CASSETTE GEAR	891	1		S
1-8	*8	83100501	IDLER GEAR 16X1-40X0.3		1		S
	#8	86312460	IDLER ASSY	TRX	1		S
1-9		83100541	IDLER GEAR 17X41X0.3		1		S
1-10		82210031	WAVE WASHER	891	1		S
1-11		83400410	CLUTCH LEVER	891	1		S
1-12		87060680	PAPER FEED MOTOR ASSY	891D	1		S
1-13		83100510	GEAR 40X0.5		1		S
1-14		83100520	IDLER GEAR 16X72X0.5		1		S
1-15		01903064	SCREW TAT 3-5 CT		2		S
1-16		02304025	POLY-SLIDER WP4X0.25		1		S
1-17	*5	80992220	FELT	891	1		

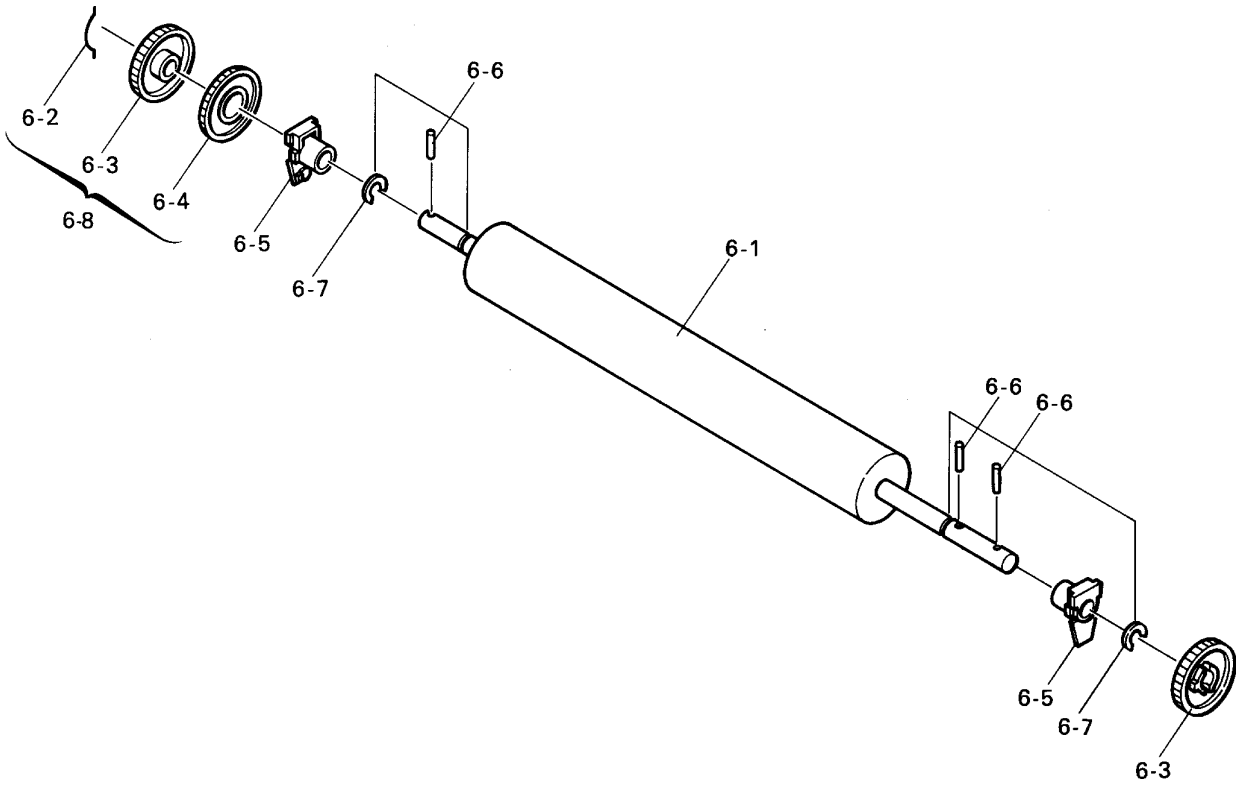
3-4. Tractor Unit



Tractor Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
8-1		83901620	TRACTOR HOLDER R	891	1		S
8-2		83901631	TRACTOR HOLDER L	891	1		S
8-3	*6	81380440	TRACTOR SHAFT	891	1		
	#6	81380442	TRACTOR SHAFT	891	1		
8-4	*5	81370521	TRACTOR STAY	891	1		
	#5	81370522	TRACTOR STAY	891	1		
8-5		83110110	SPROCKET WHEEL	891	2		S
8-6		83400311	CLAMP LEVER R	831	1		S
8-7		83400321	CLAMP LEVER L	831	1		S
8-8	*6	83901600	SHEET GUIDE	891	1		
	#6	83901601	SHEET GUIDE	891	1		
8-9		83910861	TRACTOR COVER R	891	1		S
8-10		83910871	TRACTOR COVER L	891	1		S
8-11		83110100	TRACTOR CLUTCH	891	1		S
8-12		83100530	TRACTOR GEAR 64X0.5		1		S
8-13	*6	83200650	TRACTOR BUSHING	891	2		
	#6	83200651	TRACTOR BUSHING	891	2		
8-14		02307050	POLY-SLIDER WP7X0.5		2		S
8-15	*6	80520350	SPRING C090-070-0130		1		S
	#6	80520351	SPRING C090-070-0130		1		S
8-16		04020017	STOP RING SE5.0		3		S

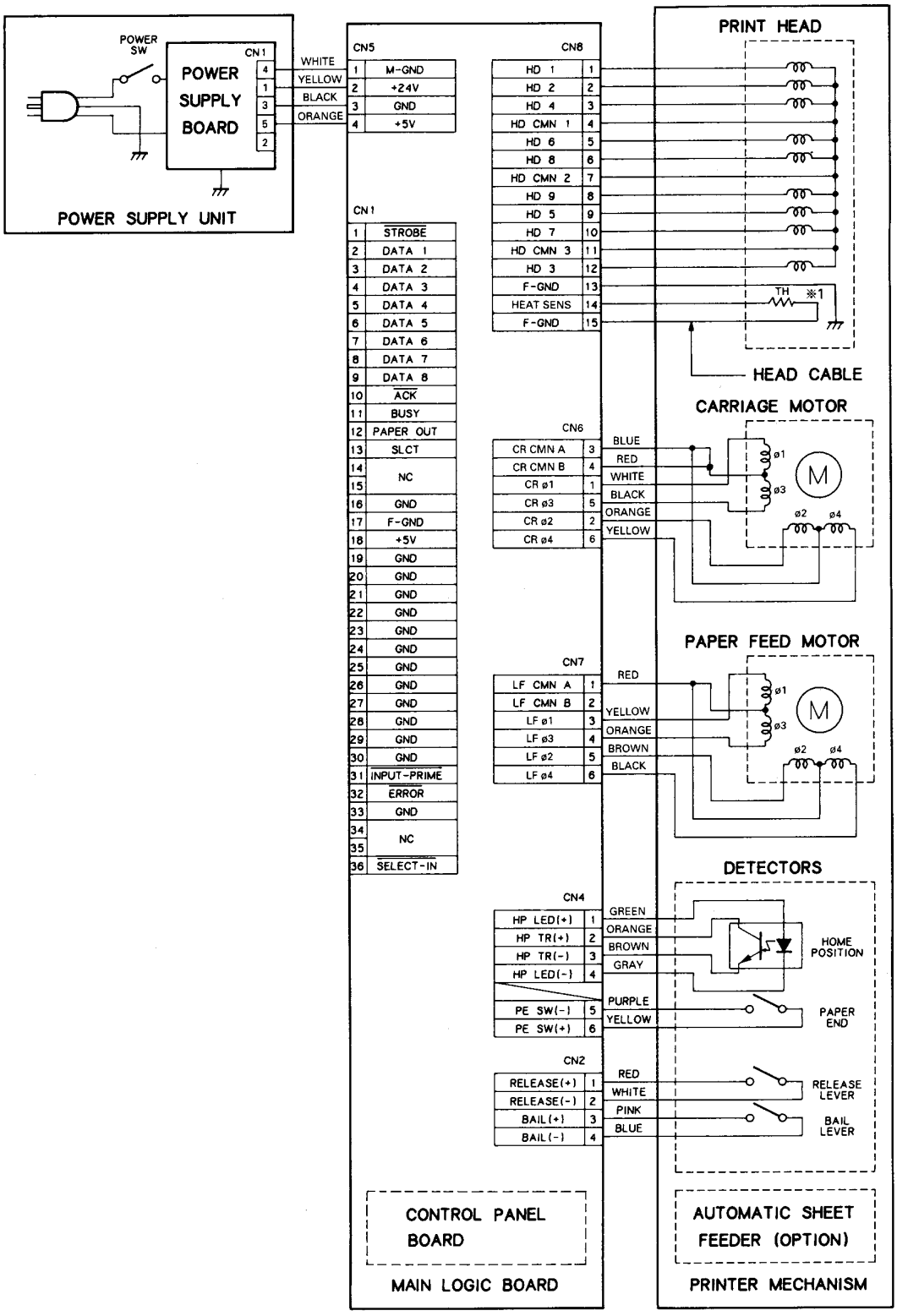
3-5. Platen Unit



Platen Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME		Q'TY	REMARKS	RANK
6-1	*6	80202130	PLATEN	891B	1		
	#6	80202031	PLATEN	891	1		
6-2		80530520	PLATEN GEAR SPRING	891	1		
6-3		83100550	PLATEN GEAR A	891	2		
6-4		83100560	PLATEN GEAR B	891	1		
6-5	*4	83200661	PLATEN HOLDER	891	2		S
	#4	83200662	PLATEN HOLDER	891	2		S
6-6		04012502	ROLL PIN SP2.5X12		3		S
6-7	*4	04020014	STOP RING SE6.0		2		S
	#4	04020022	STOP RING SE6.0-SUS		2		S
6-8	*5	87063050	PLATEN UNIT	891B	1	WITH NO.6-1 TO 6-7	S
	#5	87063340	PLATEN GEAR ASSY	891B	1	WITH NO.6-2,3,4	S

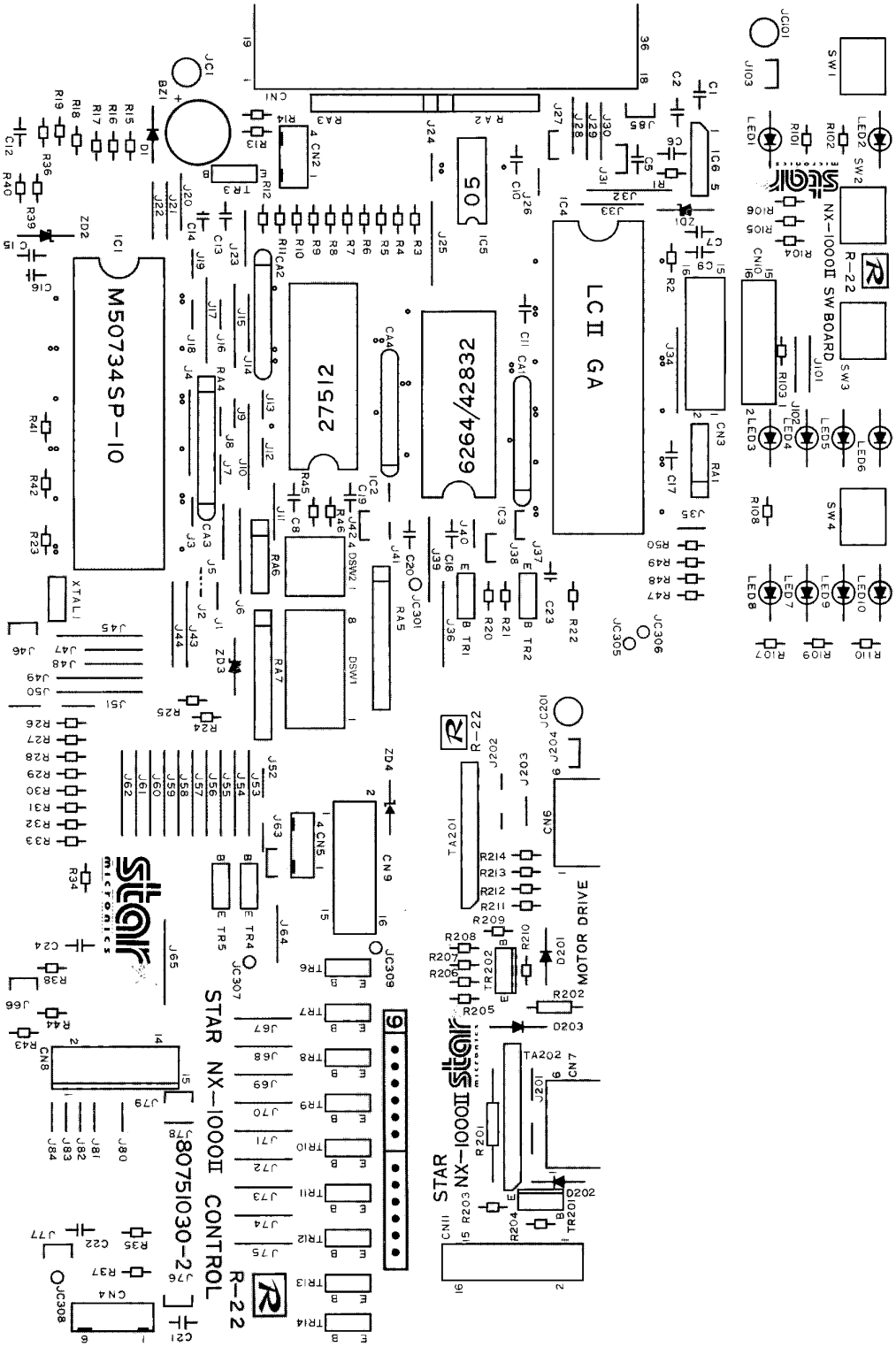
4. Wiring Scheme of Printer (Ver. 2)



※1 The thermistor in the print head is mounted for EC version only.

5. Main Logic Board (Ver. 2)

5-1. Component Layout



5-2. Parts List

Main Logic Board (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1		08250001	CPU M50734SP-10	1		S
IC2		08220116	EPROM 27512-150NS	1	LC2.** :EXCEPT SU	S
	#4	08220116	EPROM 27512-150NS	1	LC2.**.SU :FOR SU	S
IC3		08221002	SRAM HM6264P-100NS	1		S
IC4		08240013	GATE ARRAY D65006CW-LC2	1		S
IC5		08210017	TTL IC 74LS05	1		
IC6		08200109	IC-RESET M51953BL	1		S
TA201-202	*4	07650031	TRANSISTOR ARRAY STA401A	2		S
	#4	07650040	TRANSISTOR ARRAY MP4101	2		S
TR1		07011752	TRANSISTOR 2SA1266*	1		
TR2-5		07227853	TRANSISTOR 2SC1740SE	4		
TR6-14		07320411	TRANSISTOR 2SD2041	9		S
TR201		07113591	TRANSISTOR 2SB1359	1		S
TR202		07111681	TRANSISTOR 2SB1168ST	1		S
ZD1-3					NOT MOUNTED	
ZD4		08020090	ZENER DIODE RD7.5EB1T	1		
D1	*8	08000039	DIODE 1S1588	1		
	#8	08000096	DIODE 1S2076A*A	1		
D201-203		08000044	DIODE 1SR139-100AT	3		
RA1		06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA2	*4	06581824	RESIS. ARRAY 1.8K-OHM 1/8W 6EL	1		
	#4	06581823	RESIS. ARRAY 1.8K-OHM 1/8W 6EL	1		
RA3		06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
RA4					NOT MOUNTED	
RA5		06581028	RESIS. ARRAY 1 K-OHM 1/8W 9EL	1		
RA6		06584720	RESIS. ARRAY 4.7K-OHM 1/8W 4EL	1		
RA7		06584729	RESIS. ARRAY 4.7K-OHM 1/8W 8EL	1		
R1		06051525	RD RESISTOR 1.5 K-OHM 1/6W	1		
R2-10		06054725	RD RESISTOR 4.7 K-OHM 1/6W	9		
R11		06051025	RD RESISTOR 1 K-OHM 1/6W	1		
R12		06051014	RD RESISTOR 100 OHM 1/6W	1		
R13		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R14		06051025	RD RESISTOR 1 K-OHM 1/6W	1		
R15		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R16		06051514	RD RESISTOR 150 OHM 1/6W	1		
R17-19		06054725	RD RESISTOR 4.7 K-OHM 1/6W	3		
R20		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R21		06052224	RD RESISTOR 2.2 K-OHM 1/6W	1		
R22		06051034	RD RESISTOR 10 K-OHM 1/6W	1		
R23		06051051	RD RESISTOR 1 M-OHM 1/6W	1		
R24-25		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R26-34		06053314	RD RESISTOR 330 OHM 1/6W	9		
R35		06054725	RD RESISTOR 4.7 K-OHM 1/6W	1		
R36		06054734	RD RESISTOR 47 K-OHM 1/6W	1		
R37		06051514	RD RESISTOR 150 OHM 1/6W	1		
R38		06251034	RN RESISTOR 10 K-OHM 1/6W	1		
R39-42		06054725	RD RESISTOR 4.7 K-OHM 1/6W	4		
R43		06051024	RD RESISTOR 1 K-OHM 1/6W 2%	1		
R44		06054724	RD RESISTOR 4.7 K-OHM 1/6W 2%	1		
R45		06058224	RD RESISTOR 8.2 K-OHM 1/6W	1		
R46-50		06054725	RD RESISTOR 4.7 K-OHM 1/6W	5		
R101-110		06052714	RD RESISTOR 270 OHM 1/6W	10		
R201		06200274	RN RESISTOR 2.7 OHM 2W 2%	1		
R202		06220684	RN RESISTOR 6.8 OHM 1/2W	1		
R203-204		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R205-208		06051025	RD RESISTOR 1 K-OHM 1/6W	4		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
R209		06205611	RN RESISTOR 560 OHM 2W	1		
R210		06051034	RD RESISTOR 10 K-OHM 1/6W	2		
R211-214		06051025	RD RESISTOR 1 K-OHM 1/6W	4		
CA1		05652212	CAPA. ARRAY 220PF 50V 8EL	1		
CA2-4		05651012	CAPA. ARRAY 100PF 50V 8EL	3		
C1		05152234	CERA. CAPA. 0.022UF 50V	1		
C2		05254732	FILM CAPA. 0.047UF 50V	1	EXCEPT FOR HK	
					NOT MOUNTED :FOR HK	
C3-4					NOT USED	
C5		05532234	CAPACITOR 0.022UF 25V	1		
C6		05551044	CAPACITOR 0.1UF 50V	1		
C7		05152234	CERA. CAPA. 0.022UF 50V	1		
C8		05552214	CAPACITOR 220PF 50V	1		
C9	*4	05154714	CERA. CAPA. 470PF 50V	1		
	#4	05554714	CAPACITOR 470PF 50V	1		
C10		05532234	CAPACITOR 0.022UF 25V	1		
C11		05554714	CAPACITOR 470PF 50V	1		
C12		05154723	CERA. CAPA. 4700PF 50V	1		
	#4	05524724	CAPACITOR 4700PF 16V	1		
C13					NOT MOUNTED	
C14		05532234	CAPACITOR 0.022UF 25V	1		
C15-16		05152212	CERA. CAPA. 220PF 50V	2		
C17-19		05532234	CAPACITOR 0.022UF 25V	3		
C20		05552214	CAPACITOR 220PF 50V	1		
C21		05254732	FILM CAPA. 0.047UF 50V	1	EXCEPT FOR HK	
					NOT MOUNTED :FOR HK	
C22		05554714	CAPACITOR 470PF 50V	1		
C23		05154714	CERA. CAPA. 470PF 50V	1		
C24		05151033	CERA. CAPA. 0.01UF 50V	1		
XTAL1		09250035	CERA. OSCILLATOR CST10.0MT	1		
BZ1		45060201	QMB-111P	1		
DSW1		09090034	DIP SWITCH KSS08-1	1		
DSW2		09090033	DIP SWITCH KSS04-1	1		
SW1-4		09010043	PUSH SWITCH SKHHAL=S	4		
LED1		08300055	LED LT-1H11A	1		
LED2-9		08300058	LED LT-1E21A	8		
LED10		08300055	LED LT-1H11A	1		
JC1		80700250	WIRE 18UL1007BLK055T	1		
JC101		80700740	WIRE 18UL1007BLK160	1		
JC201		80700740	WIRE 18UL1007BLK160	1		
CN1		09100155	CONNECTOR 57L-40360-770B-D147	1		
CN2	*4	09100342	CONNECTOR 53014-0410	1		
	*6	09100476	CONNECTOR 53014-0470	1		
	#6	09100342	CONNECTOR 53014-0410	1		
CN3		09100339	CONNECTOR FC-16	1		
CN4	*4	09100341	CONNECTOR 53014-0610	1		
	*6	09100474	CONNECTOR 53014-0670	1		
	#6	09100341	CONNECTOR 53014-0610	1		
CN5		09100317	CONNECTOR 5483-04A	1		
CN6		09100267	CONNECTOR 5483-06A	1		
CN7		09100278	CONNECTOR 5483-06A-RED	1		
CN8		09100384	CONNECTOR HLEM15S-2	1		
CN9	*1	09100417	CONNECTOR FC-16R	1		
	#4	09100339	CONNECTOR FC-16	1		
CN10		09100339	CONNECTOR FC-16	1		
CN11	*1	09100417	CONNECTOR FC-16R	1		

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
CN11	#4	09100339	CONNECTOR FC-16	1		
J1		93930006	JUMPER WIRE STP122	1		
J2					NOT MOUNTED	
J3-85		93930006	JUMPER WIRE STP122	83		
J101-103		93930006	JUMPER WIRE STP122	3		
J201-204		93930006	JUMPER WIRE STP122	4		
-	#1	80702221	CABLE UNIT 16X150	2	FOR CN3-10,CN9-11	
	*6	80086510	BOARD ID SEAL HK	1	ONLY HK	

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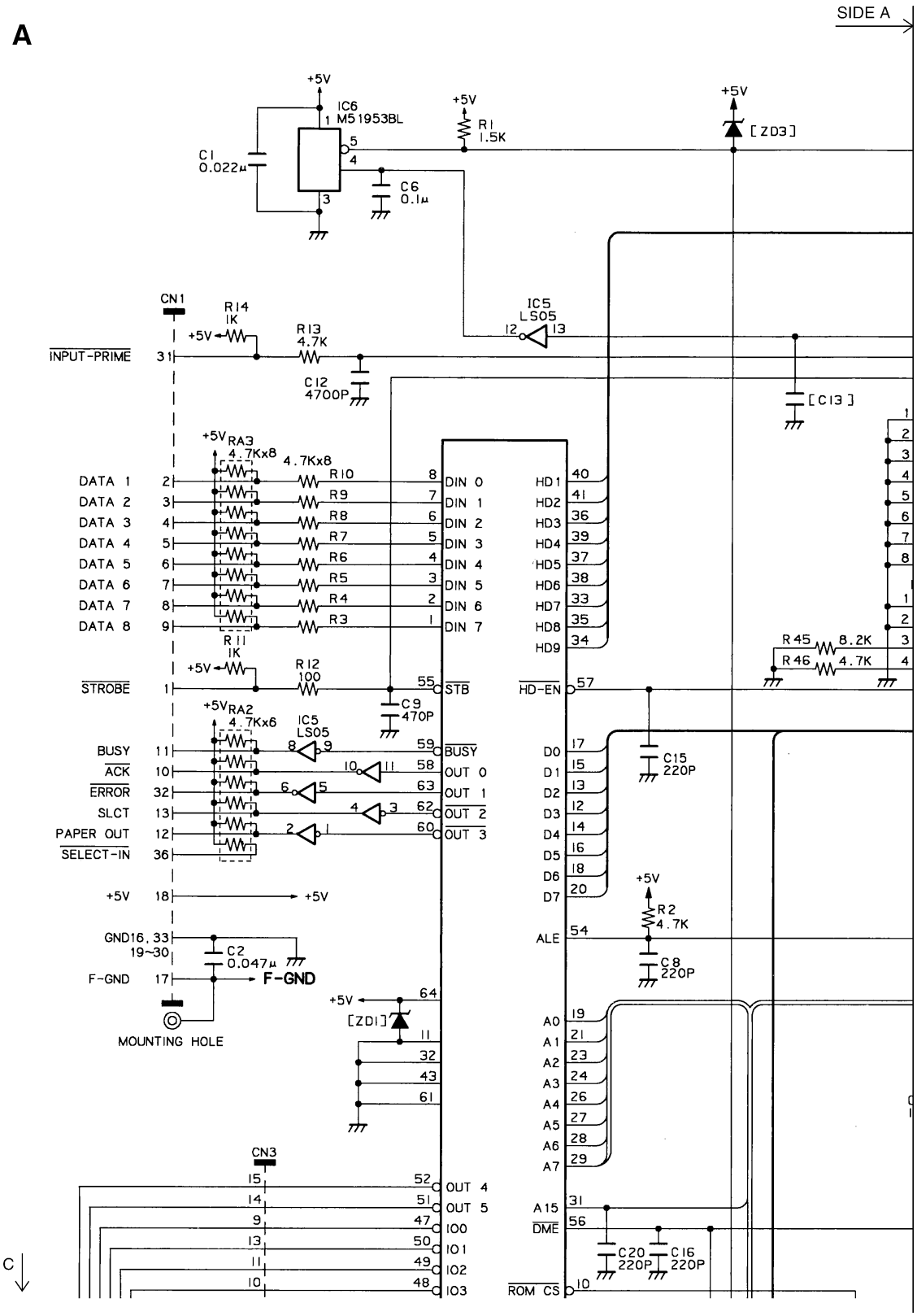
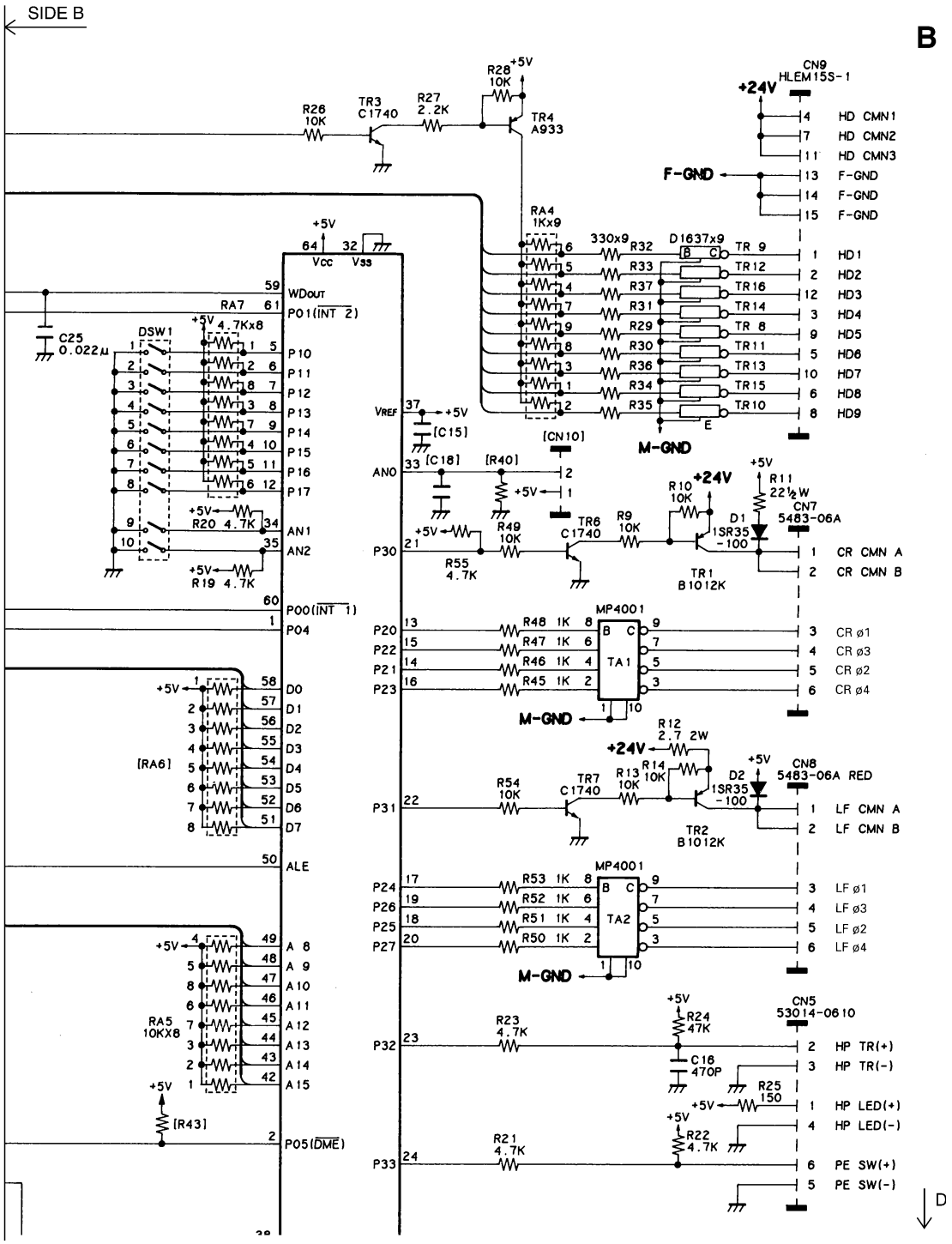
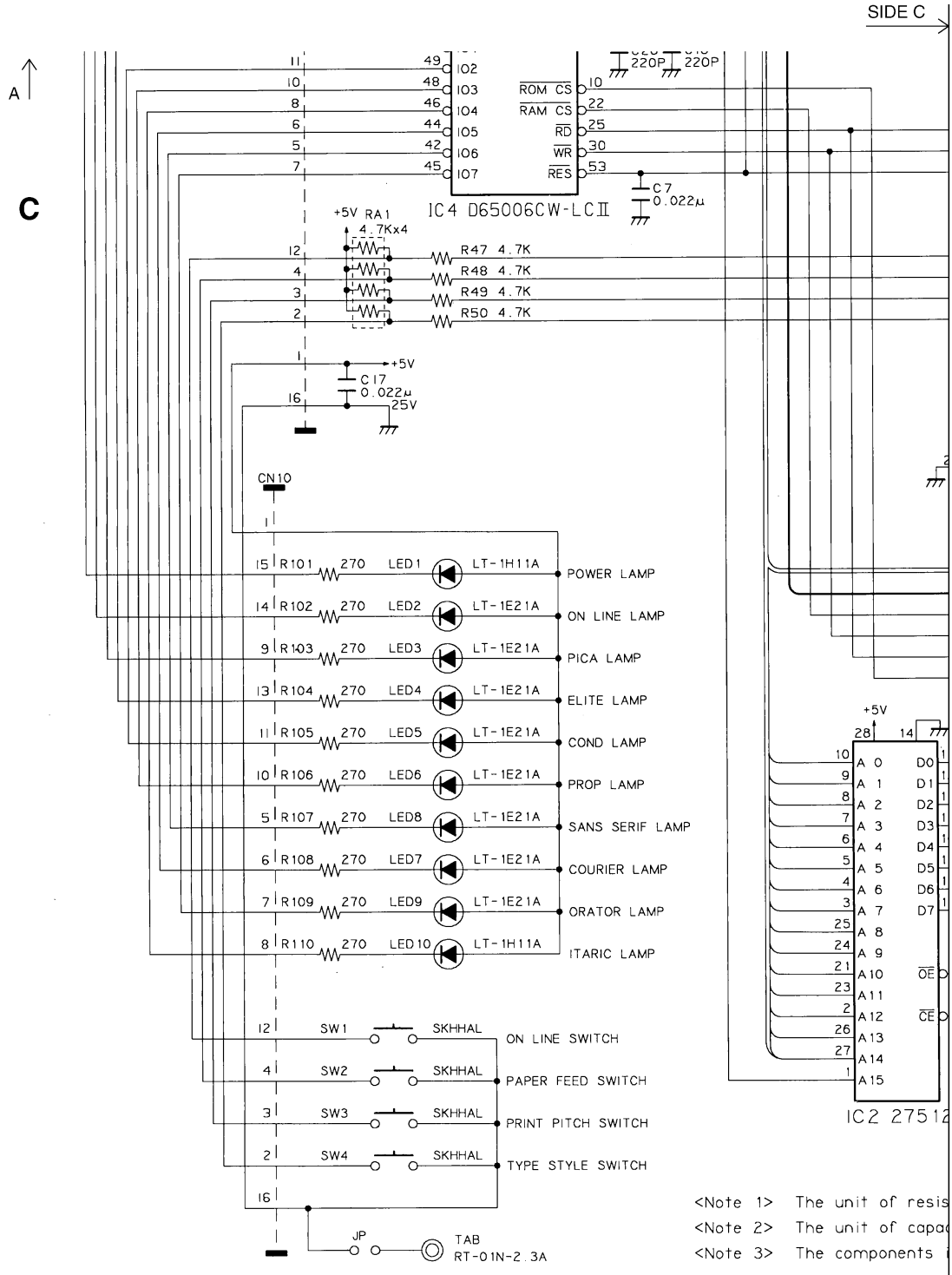
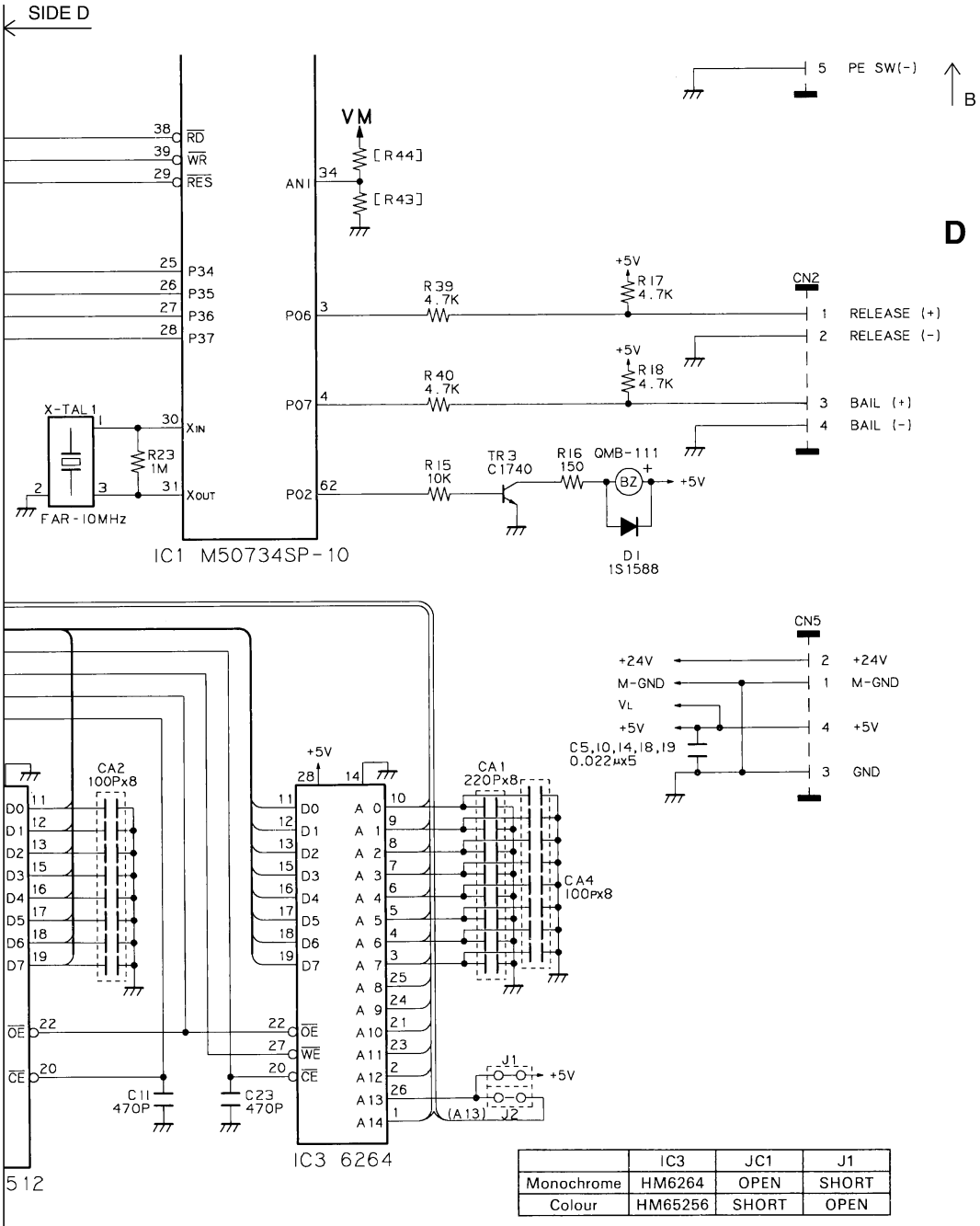
5-3. Circuit Diagram (Ver. 2)




SIDE B
B
D
R28 10K +5V
R26 10K
TR3 C1740
R27 2.2K
TR4 A933
CN9 HLEM15S-1
+24V
4 HD CMN1
7 HD CMN2
11 HD CMN3
F-GND
13 F-GND
14 F-GND
15 F-GND
RA4 1Kx9
330x9 R32
D1637x9
TR 9
R33 TR12
R37 TR16
R31 TR14
R29 TR 8
R30 TR11
R36 TR13
R34 TR15
R35 TR10
1 HD1
2 HD2
12 HD3
3 HD4
9 HD5
5 HD6
10 HD7
6 HD8
8 HD9
M-GND
+5V
64 Vcc
32 Vss
59 WDout
RA7 61 P01(INT 2)
C25 0.022μ
DSW1
4.7Kx8
P10
P11
P12
P13
P14
P15
P16
P17
R20 4.7K
AN1
AN2
R19 4.7K
60 P00(INT 1)
1 P04
VREF 37
[C15]
[CN10]
AN0 33 [C18]
[R40]
P30 21
R55 4.7K
R49 10K
TR6 C1740
R9 10K
R10 10K
+24V
R11 22½W
D1 1SR35-100
CN7 5483-06A
TR1 B1012K
1 CR CMN A
2 CR CMN B
MP4001
P20 13 R48 1K 8
P22 15 R47 1K 6
P21 14 R46 1K 4
P23 16 R45 1K 2
TA1
9 7 5 3
1 10
M-GND
3 CR ø1
4 CR ø3
5 CR ø2
6 CR ø4
[RA6]
D0 58
D1 57
D2 56
D3 55
D4 54
D5 53
D6 52
D7 51
R12 2.7 2W
+24V
R14 10K
R13 10K
TR7 C1740
R54 10K
P31 22
D2 1SR35-100
CN8 5483-06A RED
TR2 B1012K
1 LF CMN A
2 LF CMN B
50 ALE
MP4001
P24 17 R53 1K 8
P26 19 R52 1K 6
P25 18 R51 1K 4
P27 20 R50 1K 2
TA2
9 7 5 3
1 10
M-GND
3 LF ø1
4 LF ø3
5 LF ø2
6 LF ø4
RA5 10KX8
A 8 49
A 9 48
A10 47
A11 46
A12 45
A13 44
A14 43
A15 42
[R43]
2 P05(DME)
R23 4.7K
P32 23
R24 47K
C16 470P
R25 150
CN5 53014-0610
2 HP TR(+)
3 HP TR(-)
1 HP LED(+)
4 HP LED(-)
R21 4.7K
P33 24
R22 4.7K
6 PE SW(+)
5 PE SW(-)


SIDE C
A
C
IC4 D65006CW-LCII
ROM CS
RAM CS
RD
WR
RES
220P
220P
C7
0.022μ
+5V RA1
4.7Kx4
R47 4.7K
R48 4.7K
R49 4.7K
R50 4.7K
+5V
C17
0.022μ
25V
CN10
R101 270 LED1 LT-1H11A POWER LAMP
R102 270 LED2 LT-1E21A ON LINE LAMP
R103 270 LED3 LT-1E21A PICA LAMP
R104 270 LED4 LT-1E21A ELITE LAMP
R105 270 LED5 LT-1E21A COND LAMP
R106 270 LED6 LT-1E21A PROP LAMP
R107 270 LED8 LT-1E21A SANS SERIF LAMP
R108 270 LED7 LT-1E21A COURIER LAMP
R109 270 LED9 LT-1E21A ORATOR LAMP
R110 270 LED10 LT-1H11A ITARIC LAMP
SW1 SKHHAL ON LINE SWITCH
SW2 SKHHAL PAPER FEED SWITCH
SW3 SKHHAL PRINT PITCH SWITCH
SW4 SKHHAL TYPE STYLE SWITCH
JP
TAB
RT-01N-2.3A
+5V
A 0
A 1
A 2
A 3
A 4
A 5
A 6
A 7
A 8
A 9
A10
A11
A12
A13
A14
A15
D0
D1
D2
D3
D4
D5
D6
D7
OE
CE
IC2 27512
<Note 1> The unit of resis
<Note 2> The unit of capa
<Note 3> The components



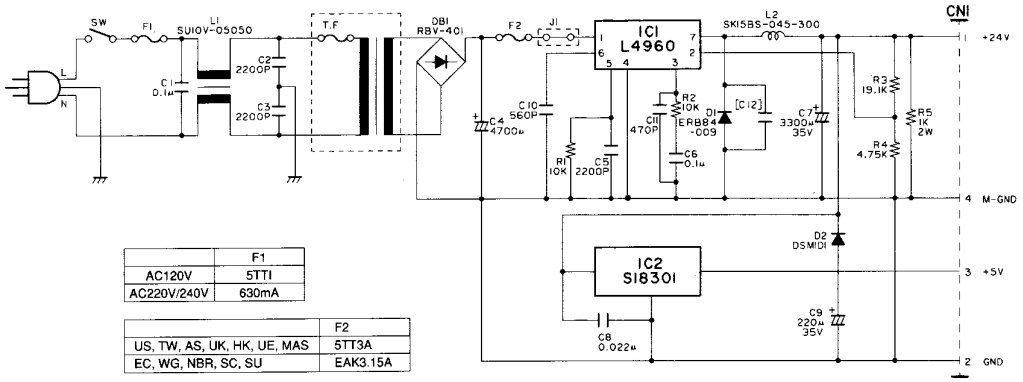
	IC3	JC1	J1
Monochrome	HM6264	OPEN	SHORT
Colour	HM65256	SHORT	OPEN

esistor and resistor array is " Ω ", and no indication of wattage means 1/6W, 1/8W respectively.
apacitor is "F", and no indication of voltage means 50V.
ts in bracket are not installed the board.

MAIN LOGIC BOARD (PARALLEL TYPE VER. 1.5)

6. Power Supply Unit (Ver. 2)

6-1. Circuit Diagram

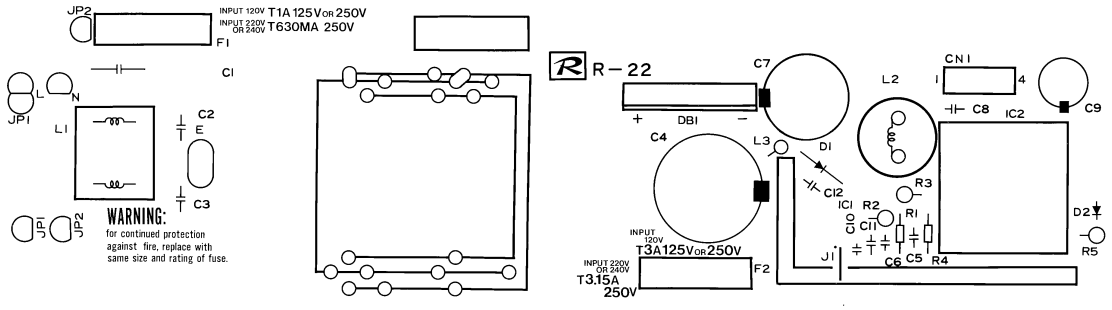


	F1
AC120V	5TTI
AC220V/240V	630mA

	F2
US, TW, AS, UK, HK, UE, MAS	5TT3A
EC, WG, NBR, SC, SU	EAK3.15A

<Note 1> The unit of resistor and resistor array is "Ω",and no indication of wattage means 1/4W respectively
<Note 2> The unit of capacitor is "F", and no indication of voltage means 50V.
<Note 3> The components in bracket are not installed the board.

6-2. Component Layout



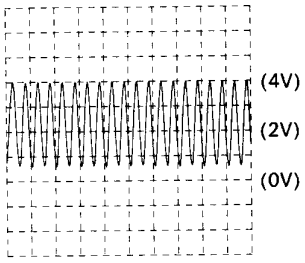
6-3. Parts List

Power Supply Unit (Ver. 2)

DRWG.NO.	REV.	PARTS NO.	PARTS NAME	Q'TY	REMARKS	RANK
IC1		08202008	IC-REG L4960	1		
IC2		08200113	IC-REG 8301L	1		
D1		08030016	SCHOTTKY DIODE ERB84-009	1		
D2		08000053	DIODE DSM1D1	1		
DB1		08990217	DIODE STACK RBA-401	1		
R1-2		06041032	RD RESISTOR 10 K-OHM 1/4W	2		
R3		06241931	RN RESISTOR 19.1 K-OHM 1/4W	1		
R4		06244722	RN RESISTOR 4.75 K-OHM 1/4W	1		
R5		06201022	RN RESISTOR 1 K-OHM 2W	1		
C1	*4	05291042	FILM CAPA. 0.1UF 250V	1		
	#4	05291045	FILM CAPA. 0.1UF 275V	1		
C2-3		05192224	CERA. CAPA. 2200PF 400V	2	EXCEPT FOR HK	
					FOR HK	
C4		05054782	CHEM. CAPA. 4700UF 50V	1		
C5		05252222	FILM CAPA. 2200PF 50V	1		
C6		05251043	FILM CAPA. 0.1UF 50V	1		
C7		05043385	CHEM. CAPA. 3300UF 35V	1		
C8		05152231	CERA. CAPA. 0.022UF 50V	1		
C9		05042271	CHEM. CAPA. 220UF 35V	1		
C10		05155611	CERA. CAPA. 560PF 50V	1		
C11		05154713	CERA. CAPA. 470PF 50V	1		
C12					NOT MOUNTED	
F1		09990058	FUSE 5TT1A 250V	1	FOR 120V	S
		09990021	FUSE EAWK630MA 250V	1	FOR 220V/240V	S
F2		09990054	FUSE 5TT3A 125V	1	EXCEPT FOR BELOW	S
		09990050	FUSE EAK3.15A 250V	1	FOR EC,WG,SC,NBR,SU	S
J1		93930006	JUMPER WIRE STP122	1	EXCEPT FOR 120V	
L1		09251106	LINE FILTER SU10V-05050	1		
L2		09251023	CHOKE COIL SK15BS045-300	1		
SW		09030010	SEESAW SWITCH WK2A44	1		
-		09240440	TRANSFORMER 120V LC-10II-P US	1	FOR 120V	
		09240450	TRANSFORMER 220V LC-10II-P EC	1	FOR 220V	
		09240460	TRANSFORMER 240V LC-10II-P UK	1	FOR 240V	
		80700140	WIRE 20UL1015BLK110	2	EXCEPT FOR BELOW	
		80700340	WIRE 20UL1015BLK095T	2	FOR EC,WG,SC,NBR,SU	
		80700220	WIRE 18UL1015G/Y067T	1	EXCEPT FOR HK	
		80700230	WIRE 18UL1015G/Y062T	1	EXCEPT FOR HK	
		80702500	CABLE UNIT 4X60 LC-10II	1		
		82911090	RADIATION PLATE NX-1000II	1		
	*7	09110065	CORD SET US-PN SPT LC	1	FOR US,UE,TW,MAS	
	#7	09110144	CORD SET US-PN HA-10	1	FOR US,UE,TW,MAS	
	*6	09110078	CORD SET EC-PN XBL	1	FOR EC,WG,SC,NBR,SU	
		09110069	CORD SET HK-PN LC	1	FOR HK	
		09110067	CORD SET UK-PN LC	1	FOR UK	
		09110068	CORD SET AS-PN LC	1	FOR AS	
		04991220	CORD BUSHING SR-5N-4	1	EXCEPT FOR BELOW	
		04991219	CORD BUSHING SR-4N-4	1	FOR US,UE,TW,MAS	
		82020280	POWER CORD COVER NX-1000	1		
		09990023	FUSE HOLDER UF-0033	4		
		09991503	TR CLIP F9006	1		
		01903064	SCREW TAT 3-5 CT	1	EXCEPT FOR BELOW	
		00630404	SCREW TR 3-4	1	FOR EC,WG,SC,NBR,SU	
					NOT USED :FOR HK	
		02110301	TOOTHED WASHER WB3	1	EXCEPT FOR HK	
		04991204	FASTENER T18S	1	EXCEPT FOR BELOW	

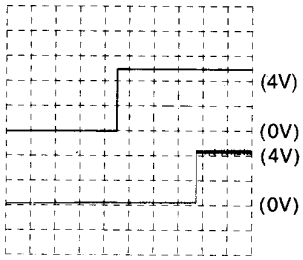
7. Waveform with Oscilloscope

(1) Crystal (10 MHz)



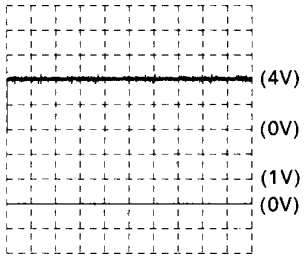
Crystal Pin 33 of IC1
Time/Div : 0.2 µs
Volt/Div : 1V

(2) $\overline{\text{RESET}}$ (Power on reset)



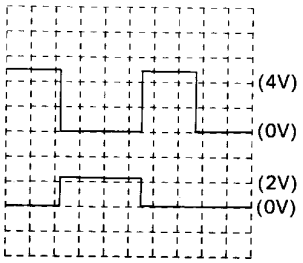
Upper : RESET input Pin 4 of IC6
Lower : RESET output Pin 5 of IC6
Time/Div : 10 ms
Volt/Div : 2V

(3) Protection Circuit



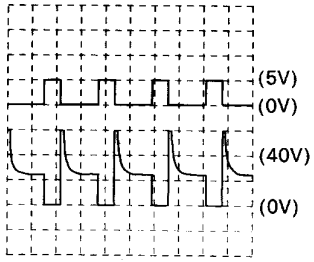
Upper : $\overline{\text{RESET}}$ Pin 5 of IC6
Lower : WD OUT Pin 59 of IC1
Time/Div : 5 ms
Volt/Div : Upper 2V
Lower 1V

(4) Head Energizing Control Signal



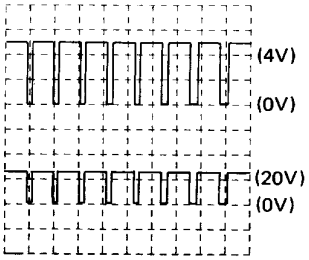
Upper : $\overline{\text{HD-EN}}$ Pin 57 of IC4
Lower : HD1 Data Pin 40 of IC4
Time/Div : 0.1 ms
Volt/Div : 2V

(5) Print Head Control Signal and Waveform



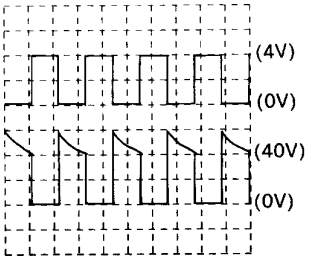
Upper : HD1 Dara Pin 40 of IC4
Lower : HD1 Pin 1 of CN8
Time/Div : 0.5 ms
Volt/Div : Upper 5V
Lower 20V

(6) Carriage Motor Common Control Signal and Diving Signal



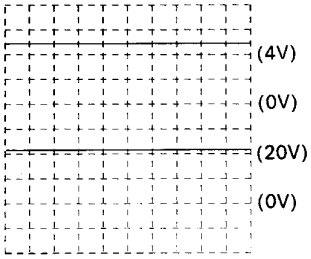
Upper : CR-CMN Control Signal Pin 21 of IC1
Lower : CR-CMN Driving Signal Pin 3 of CN6
Time/Div : 0.5 ms
Volt/Div : Upper 2V
Lower 20V

(7) Carriage Motor Control Signal and Driving Signal



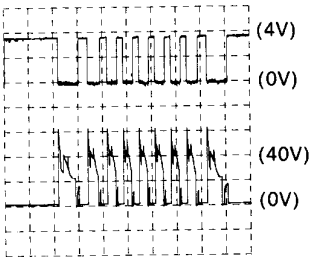
Upper : Carriage-ø1 Control Signal Pin 13 of IC1
Lower : Carriage-ø1 Driving Signal Pin 1 of CN6
Time/Div : 2 ms
Volt/Div : Upper 2V
Lower 20V

(8) Paper Feed Motor Common Control Signal and Driving Signal



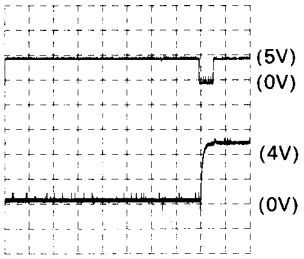
Upper : LF-CMN Control Signal Pin 22 of IC1
Lower : LF-CMN Driving Signal Pin 1 of CN7
Time/Div : 20 ms
Volt/Div : Upper 2V
Lower 10V

(9) Paper Feed Motor Control Signal and Driving Signal



Upper : LF-ø1 Control Signal Pin 17 of IC1
Lower : LF-ø1 Driving Signal Pin 3 of CN7
Time/Div : 50 ms
Volt/Div : Upper 2V
Lower 20V

(10) Parallel Interface (parallel type Only)



Upper : $\overline{\text{STB}}$ Pin 1 of CN1
Lower : BUSY Pin 11 of CN1
Time/Div : 50 ms
Volt/Div : Upper 5V
Lower 2V

APPENDIX
EXPLANATION OF PRINCIPLE ICs

CPU M50734SP **143**

Gate Array D65006CW-LC **143**

ROM MPD27C512DS **143**

RAM HM6264 ..... **143**

Gate Array D65006CW-LC2 ..... **144**

RAM HM65256 ..... **144**

Voltage Detecting IC M51953BL **144**

Transistor Array STA401 ..... **144**

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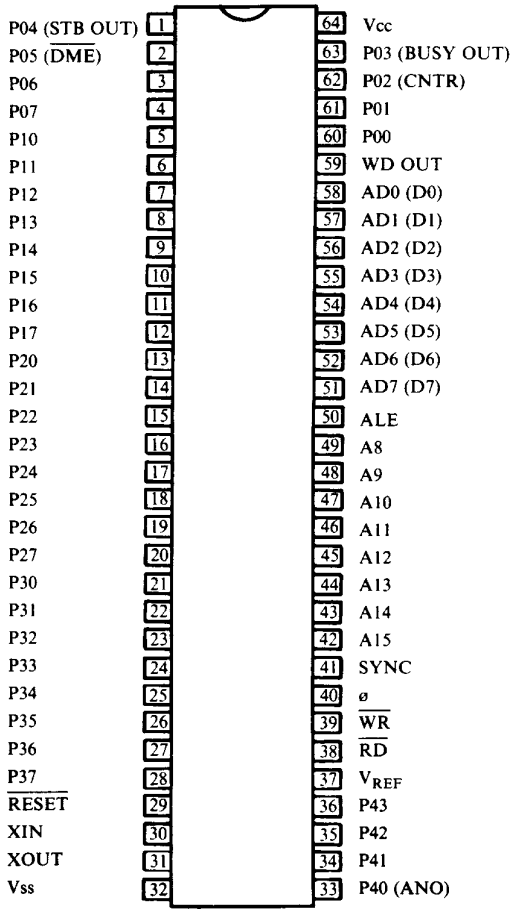
Transistor 2SD2010 ..... **145**

APP.

(1) CPU M50734SP

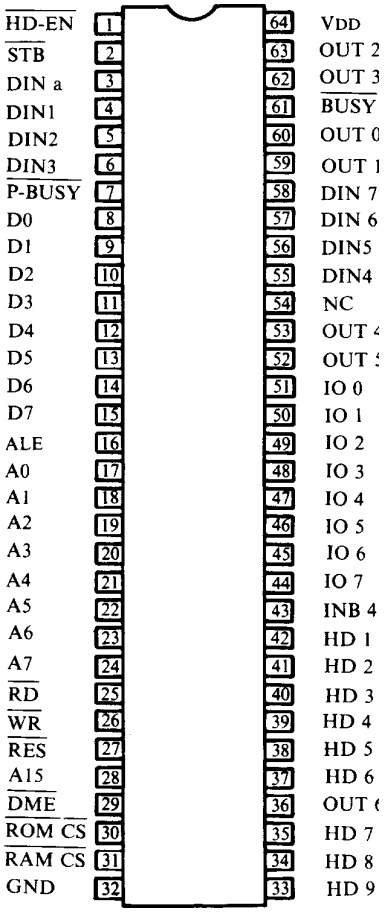
M50734SP is a CMOS, 8-bit, single-chip microprocessor comprised of a UART, a clock synchronous serial I/O, an A-D convertor, a VCU, a watchdog timer and 32 parallel I/O terminals.



(2) Gate Array

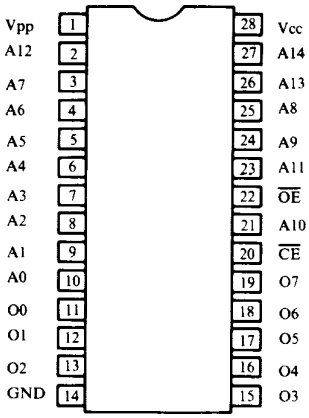
D65006CW-LC

Parts No. 08240001



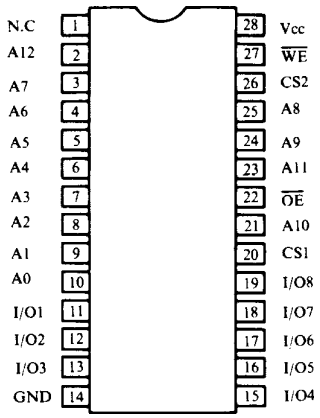
(3) ROM MPD27C512DS

65536-Word×8-bit Ultraviolet erasable and Programmable read only memory

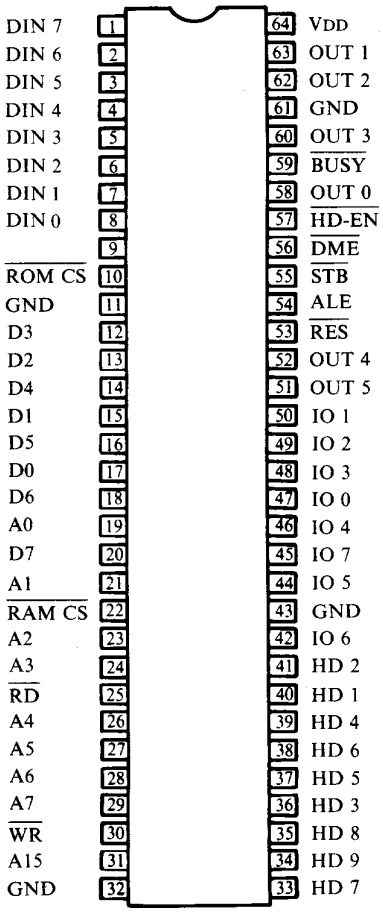


(4) RAM HM6264

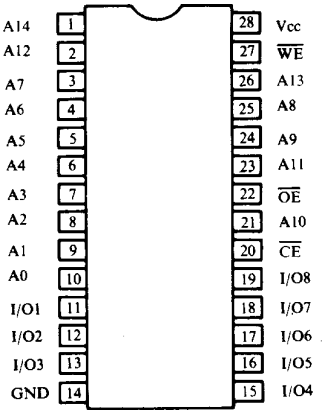
8192-word×8-bit Static random access memory



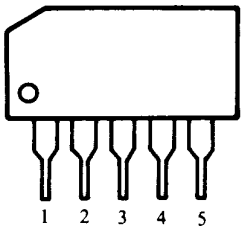
(5) Gate Array D65006CW-LC2
Parts No. 08240013



(6) RAM HM65256
32768-word × 8-bit Pseudo Static random access memory.

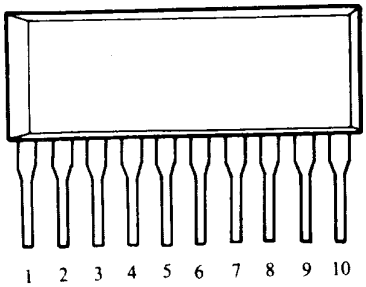


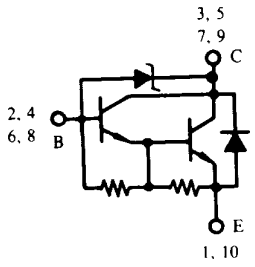
(7) Voltage Detecting IC M51953BL
Refer to Fig. 2-21 and Fig. 2-22 of Chapter 2 for the equivalent circuit and operational timing chart.



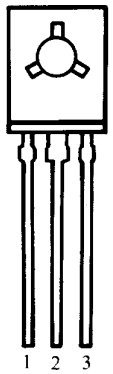
1	Vcc
2	In
3	GND
4	Cd
5	OUT

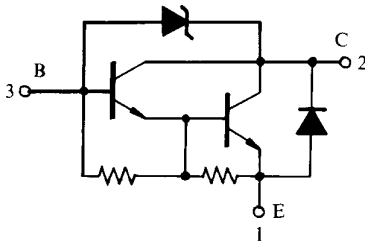
(8) Transistor Array STA401



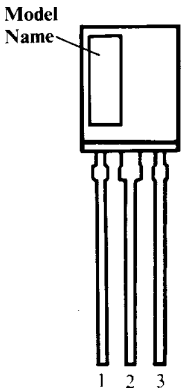


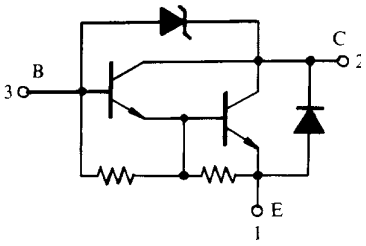
(9) Transistor 2SD1637





(10) Transistor 2SD2010





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